

CLINICAL MEDICINE AND SURGERY

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• LEADING ARTICLES •

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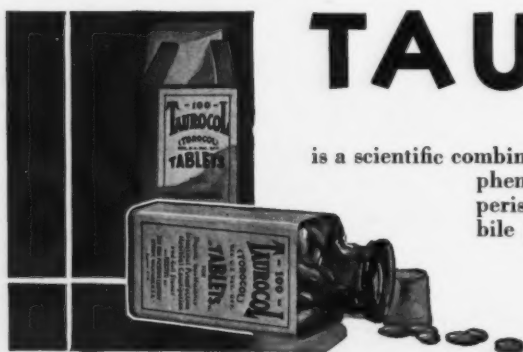
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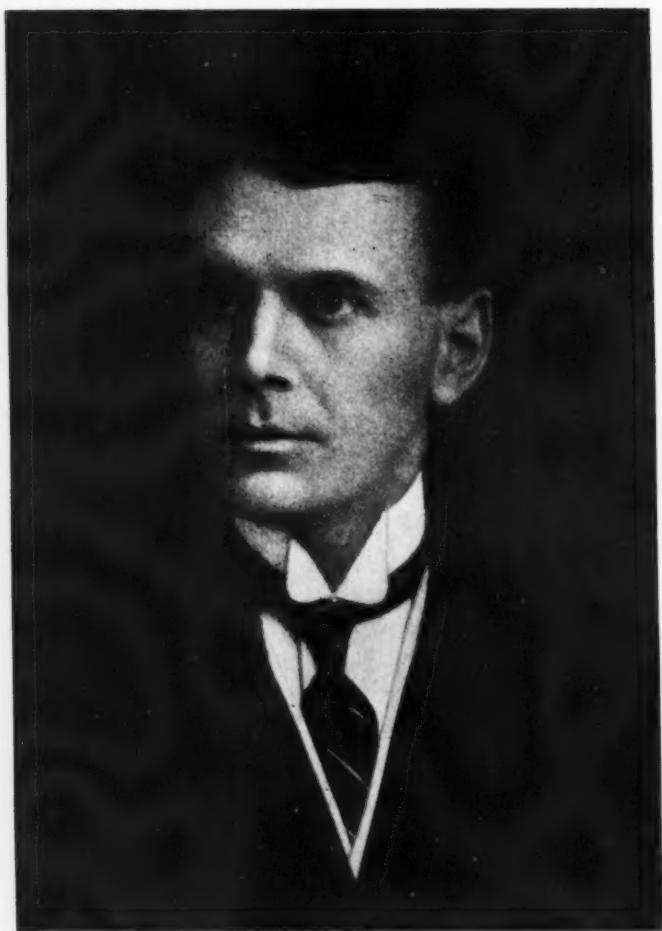


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CLINICAL MEDICINE AND SURGERY

GEORGE B. LAKE, M.D.

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Vol. 40

OCTOBER, 1933

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EDITORIAL

James E. R. McDonagh*

WHEN our hardy forefathers started out across the western plains in covered wagons, to occupy and develop a new territory, they encountered heartbreaking difficulties and discouragements—but they were not broken! They did not know how good and pleasant the land into which they were moving would be, but they were determined to find out, for the benefit of unborn generations and to satisfy their own lust for knowledge of the unknown.

On October 17, 1881, one of the constitutional path-breakers was born in London, England, although the parents of James Eustace Radclyffe McDonagh had no idea of that sort at the time.

When he was old enough to begin receiving formal instruction, young James was sent to the Bedford Grammar School and, when that was finished, went to St. Bartholomew's Hospital ("Barts") to lay the foundation of his medical education, upon which he built by spending some time in the *Algemeinen Krankenhaus* and other schools and hospitals in Vienna.

In 1906 he became a Licentiate of the Royal College of Physicians and a Member of the

Royal College of Surgeons (he advanced to Fellowship in the latter organization in 1909, but never became a Doctor of Medicine, though, of course, he is a full-fledged physician in his own country), and began his medical career as a surgeon, having held official positions at "Barts" and at two hospitals in Vienna and, though his interest spread into other lines of work, he was surgeon at the London Lock Hospitals for twenty-two years and Hunterian Professor, Royal College of Surgeons, in 1916.

His next adventure was in dermatology and venereal diseases, where, no doubt, he laid the foundation for his later studies of syphilis. He was pathologist and clinical assistant at the Skin Hospital, Blackfriars; chief assistant in the skin department at St. Bart's and the West London Hospitals; and dermatologist at the London County War Hospital, Epsom.

For several years he has been engaged in the general practice of medicine, along the lines indicated by the researches which he began as an undergraduate and has continued daily ever since.

During the War, he was a captain in the Royal Army Medical Corps and a member of the Chemical Warfare Committee.

*The portrait accompanying this sketch, which is the only one obtainable, was taken when McDonagh was thirty years old.

Mr. McDonagh is a fellow of the Royal Society of Medicine (formerly honorable secretary of its section on dermatology) and a member of several local and foreign medical societies. Several years ago he resigned his membership in the British Medical Association and severed his hospital connections, in order to have a freer hand and to concentrate his energies upon the Nature of Disease Institute, which he founded in 1930, in order to extend his researches and give treatment to his patients at fees they could afford to pay.

He is the author of a book, "Venereal Diseases," and of the monumental, three-volume "Nature of Disease," which is being expanded each year in the *Nature of Disease Journal*, as well as of many articles in English and other medical journals.

McDonagh's place in medical history will, no doubt, be founded upon the revolutionary conclusions which have resulted from his intensive and extensive studies in chemistry, physics and parasitology, as these sciences bear upon clinical medicine; for he is, before all else, an active clinician.

In chemistry, he has studied the action of drugs in the living human body and has introduced into medicine a number of colloid preparations, various compounds of sulphur and some of the symmetrical urea compounds, as well as the use of antimony in bilharziasis.

In physics, he has thrown light upon the clotting of blood, the rationale of the Wassermann reaction and many of the problems of shock and the toxemias of pregnancy.

In parasitology, he has identified the *Leukocytozoon syphilidis* as the cause of syphilis, the *Spirocheta pallida* being no more than the adult, male phase of this protozoan. He has also announced many reasonable ideas as to the nature and cause of the common cold, influenza, "food-poisoning" and other diseases and has promulgated the theory of intrinsic and extrinsic diseases, resting largely upon intestinal infections and toxemias.

His best-known work is in connection with his studies of the condition and activities of the ultramicroscopic protein particles of the blood, and the viscosity, refractometric index and sedimentation time of the red corpuscles in that fluid.

McDonagh appears to be a figure of such size that it will be difficult, if not impossible,

for his own generation to form a just estimate of the importance and value of his contributions to medicine. Meantime, no progressive physician can afford to be entirely unfamiliar with his work, because, if he is wrong, he is none the less highly interesting; and if he is right, his ideas will revolutionize the practice of medicine.

Men who think are the only salvation of society, the only strength of government, the only bulwark of liberty, the only promoters of happiness and content.
—W. G. SIBLEY.

Encephalitis Lethargica

THE epidemic of encephalitis lethargica in St. Louis, which, up to the time of this writing, has included nearly 500 cases, with more than 60 deaths, is causing much consternation and a flood of misinformation in the newspapers.

This disease (sometimes called "sleeping influenza" or "sleeping sickness") should not be confused with African sleeping sickness, the cause of which is well known to be an animal parasite, *Trypanosoma gambiense* or *T. rodensense* (the latter being more virulent), transmitted by various species of the *Glossina* or tsetse fly. There is also a South American form of this disease, called Chagas' disease and caused by *Trypanosoma cruzi*, which is transmitted by a bug known as *Triatoma megista*. So far as we can learn, no cases of true sleeping sickness have been reported in North America, though some newspapers have hinted that tsetse flies have been seen in and around St. Louis.

The African and South American disease can be diagnosed fairly readily by finding the trypanosomes in the blood of infected patients and by the occurrence of irregular attacks of fever, with polyadenitis and exanthems, followed by nervous symptoms ending in somnolence, coma and death. In the early stages, various arsenicals (especially atoxyl and tryparsamid) and certain salts of antimony are specifically curative.

About the cause, epidemiology and cure of encephalitis lethargica we know very little, so far, but vigorous researches are being carried on. The cause is probably a filterable virus; the transmission is possibly through the upper respiratory tract (though this is

by no means proved); no insect vector has yet been incriminated, though the fact that epidemics almost always occur in July and August suggests such a possibility. The virus seems to be allied to that of herpes. So far, no success has been obtained in inoculating any of the lower animals.

Previous to 1922, the early, acute symptoms of encephalitis seem to have resembled those of influenza or a severe cold, with nervous manifestations following later. Now many cases are seen with fully developed nerve lesions and no history of an acute episode.

Cecil speaks of four types of the disease: Somnolent-ophthalmoplegic; Parkinson-like; hyperkinetic; and psychotic. The symptoms may, in some cases, resemble those of meningitis, epilepsy, tabes or poliomyelitis. In the parkinsonian forms, the pill-rolling tremor is usually absent. Eye-muscle paralysis, mental confusion and somnolence are often early symptoms; but insomnia and overactivity are seen in hyperkinetic cases. The disease may simulate almost any of the known neurologic syndromes and, except in the presence of an epidemic, the diagnosis is often very difficult.

As to treatment, there is, as yet, no consensus. Convalescent serum, injected intramuscularly, seems to have the most advocates and the best reported results. Opinions vary as to the advisability of doing spinal puncture during the acute stages of the disease.

Among the drugs which have been reported by several workers as giving favorable results are: Acriflavine; sodium cacodylate, intravenously in large doses; iodides (sodium iodide, Pregl's solution, etc.), intravenously; sodium salicylate and methenamin, separately or combined (a good combination is found in Salihexin), intravenously; dextrose, intravenously (sometimes combined with some of the other drugs); and non-specific protein therapy, using Lactigen, Omnadin, Vaccineurin, etc. intramuscularly. Such a preparation as Metaphen, 1:1,000, might be tried, intravenously.

For the oculogyric spasms, the best remedies seem to be atropine, hyoscine and genoscolamine, given hypodermically. Sometimes a dose of 1/100 grain of hyoscine hydrobromide, every other day, will keep a patient free from such spasms for a long time.

The parkinsonian symptoms are best relieved by hyoscine hydrobromide or stramonium, given by mouth in gradually increasing doses, until the optimum or maximum tolerated dose is ascertained, and then continuing the medication at or slightly below that level. Various physical methods of treatment should be used to meet symptoms, as indicated.

While science is, as yet, largely in the dark regarding this serious disease, which is not at all widely prevalent, compared with other epidemic diseases, and is not actively contagious, it would be a grievous mistake, in many ways, to permit these patients to die or recover without making some effort to help them. Those who try these suggestions are invited to report their results, with full details.

A well-made question is an immaterial tool of analysis.—DR. RICHARD C. CABOT.

Therapeutics

BECAUSE therapeutics is such an integral and vital part of a physician's economic, as well as professional, success, we have placed Dr. Osborne's excellent article in this issue in the department *A Living for the Doctor*. We hope it will be widely read and earnestly pondered.

It is well that every practicable effort be made to arrive at an accurate and scientific diagnosis of every case. But it is *not* well, for those who aspire to recognition and remuneration as clinicians, to defer the employment of any remedy until a complete diagnosis has been made. People come to doctors to be relieved of their distresses of mind or body or both, and their gratitude (and dollars) will flow toward the man who *gives* them such relief, quickly, easily and as pleasantly as possible. That is the secret of the financial success of many of the irregulars—they lay far more stress on clinical relief than they do upon meticulous diagnosis.

Emphasis should also be placed upon what he says about symptomatic treatment and the empiric art of therapeutics. It is well that conditions causing a patient's symptoms should be discovered as promptly and removed as thoroughly as possible. But it is also well

that the clinician should treat the distressing symptoms while arriving at a scientific diagnosis (if that proves to be possible) and at all other times, using such remedies as practical experience has shown to be helpful in relieving the presenting symptoms, whether the laboratory workers have demonstrated a basis for such use or not.

There is no reason why those should despair whose undergraduate instruction in therapeutics was deficient. Many practical and helpful books on the subject are available, and we are publishing a great deal of material along this line. Diligent study of the information at hand and the regular, daily use of the ideas so obtained, will enable any intelligent and ambitious physician to reach a high degree of proficiency in the art and science of therapeutics.

With two points in Dr. Osborne's article we disagree, and take this opportunity to express that disagreement, so that our readers can draw their own conclusions, after hearing both sides of the question.

Instead of deploring the increasing use of parenteral medication, we believe that the administration of drugs by the injection method enables a physician to maintain better control over his patients and makes for greater certainty and accuracy in treatment, as well as adding materially to his prestige and his income.

We also believe that the psychic status of practically every patient who consults a physician is a very definite factor in his condition, and that every medical student, early in his undergraduate training, should receive sufficient instruction in normal and pathologic psychology to enable him to evaluate that factor soundly. This does not mean that he should be a trained psychiatrist (that is a specialty in itself), but that he should be able to recognize the commoner psychic aberrations and know which he should be able to treat and which should be referred to an expert.

In the main, Dr. Osborne's article is so rational and pertinent that we hope every reader will study it carefully and do all he

can to see that unsatisfactory conditions are remedied in our medical schools, or, at least, in his own practice.

The Status of Medical Practice

ALTHOUGH there are some whose conduct would lead one to believe that they look upon the practice of medicine as a trade or industry, the general consensus has never placed it in that category, and the overwhelming majority of physicians are high-minded professional men.

Even those physicians who employ non-medical assistants to help them in their work are not engaged in the manufacture or distribution of any tangible commodity and hence are not industrialists in any recognized sense, unless more than two *non-technical* helpers (bookkeepers, laborers, etc.) are employed.

It is, therefore, difficult to see how medical men can be brought under the provisions of the National Industrial Recovery Act, and any effort to persuade or coerce them into signing any code or agreement to this end should be most carefully scrutinized as to its source and intent. The difficulties of achieving a livelihood by medical practice are sufficiently great as it is, without adding to them any artificial and arbitrary restrictions.

It has already been ruled that hospitals not actually carrying on a trade or industry do not come under the requirements of a code of fair competition, and that will be a relief to many.

It is rather easy, in present circumstances, for people who are not accustomed to doing their own thinking to be stampeded into courses of action which, on mature consideration, prove to be ill-advised or even disastrous. This is merely a suggestion to physicians to stop, look and think before acting on suggestions, with whose connotations and results they are more or less completely unfamiliar, under the stimulus of high-pressure propaganda.

LEADING ARTICLES

The Origin and Nature of Disease

By J. E. R. McDonagh, F.R.C.S., London, Eng.

THROUGHOUT my work I attempt to correlate rather than to differentiate. To my mind, differentiation is the besetting sin of the medical profession. We are always attempting to trace out minute differences between closely related manifestations of disease, when it would really be more helpful to look for resemblances and to relate similar conditions to similar causes. An example that will illustrate what I mean, and to which I shall be returning later, is that of arteriosclerotic, diabetic and albuminuric retinitis. We try to see as many differences as possible between the three conditions, instead of observing the resemblances and trying to trace them to a common origin.

As I shall explain later, I have come to the conclusion that there is only one disease process and that all the multifarious conditions that we read of in the textbooks are different expressions of the same fundamental process. For, after all, even in infections, it is not the particular micro-organism that is the important factor in disease; it is the patient's reaction to the invader. And the reaction of the body is, I believe, the same in essence whether the invader be a micro-organism, a chemical, a physical or a psychologic agent. We must get away from thinking of "diseases of the nervous system" and "diseases of the circulatory system" and remember that the body is an indivisible unit and that there is never disease of this or that system without disease of the whole organism. Following from this, we must appreciate that the same essential disease process may produce different textbook conditions, according to which system or organ is principally affected. And the organ which is affected is determined more by the body's resistance than by the invader.

The body is a unit, built up of a series of colloid systems which are closely interdependent. There are two main types involved: First there is the fluid system—the blood plasma, the lymph, the cerebrospinal fluid, the synovial fluid, etc. Here the dispersed phase is "solid" and the dispersion medium or continuous phase is liquid; second, there are the various cell systems, where the phases

are reversed—that is to say, the liquid phase is dispersed in a "solid" dispersion medium.

I am convinced that all manifestations of disease are due to disequilibrium between the various colloid systems, brought about by some invader.

Colloids

Before proceeding further I should like to remind you briefly of some of the properties of colloids. Let us, for a moment, consider a system like the blood plasma, where the dispersed phase is "solid" and the dispersion medium liquid. The forces which keep the colloid particles of such a system in suspension are of two main kinds: First, there is the electric charge on the particles, which is dependent upon their chemical nature. The charge on each particle is the same and therefore they repel one another; and, second, there is a force which is always located at the interface between the two phases. This force is related to surface tension and is proportional to the area of the surface. It will be seen, then, that the surface energy will be greatest when the suspended matter is in a very fine state of division, as then the ratio of surface to mass is greater. This type of energy is not confined to colloid particles, it exists also in crystalloid solutions, but in these it is relatively much less important, as the molecules of the solvent are very much closer to the molecules of the solute than is the case with colloids. In crystalloid solutions the surface energy becomes important only when the dilution is so great that the solute exists as single molecules, or even as atoms. It is upon this, I believe, that the action of homeopathic remedies depends.

I am going to use the term "*activity*" to express the total energy of a colloid or crystalloid substance. I know that this is a somewhat loose expression, but I use it for want of a better and because there is something we do not altogether understand about the action of these substances and which can best be spoken of in this way. For I am coming to the conclusion that every substance, whether inorganic, organic or living, has a specific energy of its own which is partly chemical, partly electric, and largely dependent on its state of condensation. On what other prop-

*Read before a joint meeting of the Hampstead and Paddington Medical Societies, May 9th, 1933.

erties it is also dependent I do not yet know. It is this specific energy which I shall refer to as "activity."

Now that I have laid out my conception of the material with which we are dealing in studying the nature of disease, I should like, very briefly, to outline what probably happened "in the high and far off times" (as Kipling puts it), to give rise to disease.

I believe that disease had its origin in the very same moment that saw the beginning of life. We must assume that life arose as a condensation of atoms and molecules into some sort of elementary organic froth, which, owing to a high intrinsic activity, acquired the power of self-propagation. But, as we know from observing colloid systems *in vitro*, the change of condensation does not occur uniformly throughout the system, but takes place unevenly, possibly spreading from one center, more marked in one part than another; and it was probably an uneven condensation of this sort which gave rise to the first living element. But it is also this tendency for actions, especially in colloid systems, to take place unevenly, that is responsible for disease. Disease is due to disequilibrium between the various colloid systems that make up the body, and this disequilibrium might be said to be inherent in the nature of the colloid state. Hence it was present before life, which gave birth to what we call "disease," was generated.

The Blood Plasma

I come now to a fuller explanation of what I understand to be the nature of disease; and for this I will ask you to consider in more detail the soil on which the greater part of the battle takes place; namely, the blood plasma.

The blood plasma is an excessively complex system. In it there are many bodies whose characteristics vary according to whether they are loosely or closely attached to the protein. The more loosely they are attached, the more crystalloid is their nature, and the more closely they are attached the more colloid is their nature. The dispersed phase in the blood plasma may be said to be protein nuclei, with fat, urea, sugar and mineral salts more or less loosely jointed on to them. The size of the protein particles depends upon the size of the nucleus, upon the number of the nuclei and upon how many of those other bodies, which we may call "planets," are attached to it and whether they are closely or loosely attached.

The size of the particles is very important, as it determines the area of the surface, and on this depends one component of the particle's total energy.

In general, and within limits, if the suspended phase is in a fine state of division,

the particles will have plenty of activity; whereas a tendency for the particles to clump together into larger aggregates makes for sluggishness and may lead to precipitation.

The suspended phase, in the form of protein nuclei with their attached "planets," will be referred to as "protein particles" and, in my view, they form the *dynamic* resistance of the body; whereas the cell systems form the *static* resistance. The effectiveness of the dynamic resistance depends upon its retaining its full measure of activity and its normal state of dispersion.

When an invader makes its appearance, whether it be of the patient's own manufacture or an external agent, it has no general action on the body until it reaches the blood stream. Here it is attacked by the dynamic elements. The invader robs some of the particles of their activity, and they split up; and the planets, or some of them, are liberated. In the process of splitting up, molecules of water are set free, so I refer to this process as *dehydration*. If the invader is present in only small amount, the activity set free from the dehydrated particles is sufficient to overcome the attack and the system shortly returns to normal. If, on the other hand, the invader is present in large or increasing amount, a very large number of particles may be split up in this way, and some of the energy set free is transformed into heat, causing a rise of body temperature.

When a particle is split up, two or three different things may happen to the fragments. Some of the "planets," e.g. calcium, sugar, urea and even individual amino acids, may become separated and pass out of the colloid state altogether and go into true solution as crystalloids. The protein fragments, and very often some of the "planets" also, become attached to neighboring particles which, therefore, increase in size. In this process of building up, molecules of water are absorbed, so that the process may be spoken of as *hydration*. It is seen, then, that dehydration is always accompanied by hydration. In an extreme case, such as streptococcal septicemia, where dehydration is going on at a great rate, the dehydration outstrips the hydration and the particles remaining take up as many of the fragments as they can, but there are many fragments that cannot be accommodated, with the result that the "planets" go into true solution, which results in a rise in the percentage, first, of the blood-sugar and then of the blood-urea. Along with these changes there occurs a lowering of the refractive index of the serum and a reduction of the suspension stability of the red cells. The former is associated with the decrease in the number of particles, owing to some being sent into crystalloid solution; the latter with the loss of the electric charge on the particles.

The changes of dehydration and hydration can be studied in the drawn blood by certain chemical and physical tests. Under the ultra-microscope, the size of the particles, the activity of their Brownian movements and the tendency to precipitation may be roughly gaged. This is a somewhat crude method of studying such a delicate and complicated series of changes, but with experience and by taking into account the results of other tests, a fair notion may be gained of the state of the patient's dynamic resistance. The other tests are those mentioned above; namely, blood-sugar and blood-urea readings, refractive index of the serum and suspension stability of the red cells. I am convinced, however, that more accurate information could be obtained if one could measure the amount of activity lost by the particles, and I am now engaged in an attempt to find a method of doing this.

Mechanism of Disease

Let us return to the general question of the action of invaders. It will be remembered that the first action of any invader is to rob some of the particles of their activity and so cause some dehydration, and also that this dehydration is always accompanied by a certain amount of hydration.

The various manifestations of disease which will arise, depend upon the amount and degree of the initial dehydration, the amount, chronicity and type of hydration that accompanies it and the effect of these processes on the fixed tissues or "static resistance." The fixed-cell systems may be affected in one or more of three ways: Either the changes in the electric state of the dynamic resistance induce changes in the colloid state of the cells, resulting in an interference with their function; or there may be a failure of nutrition of the fixed systems, owing to the damage done to the dynamic system; or the invader, if present in sufficient amount, may act directly on the protoplasm of the cells. The first two causes are of far greater importance than the third.

Before it is possible to understand the variations that can be rung on this theme of dehydration and hydration, two things must be borne in mind. The first is that, owing to previously existing disease, the protein particles may already be dehydrated (or more probably hydrated), so that the action of the invader is not necessarily a simple one.

The second thing is that these changes of dehydration and hydration follow one another, so that, while some particles are being dehydrated, others are, *pari passu*, becoming hydrated, and these may again be dehydrated by the further action of the invader. The result is that the state of the particles, once the original equilibrium of health has been upset, may go on changing rhythmically in a pendulum-like manner. When particles that

have been hydrated become dehydrated, and then subsequently undergo further hydration, the change becomes one of re-hydration. With each cycle or swing of the pendulum, the particles lose more activity, their Brownian movements become more sluggish and they have a growing tendency to precipitation.

The object of therapy must always be to break the vicious circle and to restore the protein particles as nearly as possible to their original condition. Thus, if dehydration prevails, one must give a drug which aids the process of hydration; whereas, when hydration is in the ascendancy, one must try to bring about dispersion. Note that I here use the term "*dispersion*" and not dehydration. Dehydration of protein particles is preceded or accompanied by loss of activity; whereas, in order to restore the dynamic resistance to its normal state, it is necessary, not only to restore the protein particles approximately to their former degree of colloid relationship, but also to restore their activity, as otherwise the colloid complex will not be in equilibrium and the changes of dehydration and re-hydration will set in once more.

Intrinsic and Extrinsic Disease

I have referred above to diseases being the result of an inherent property of the colloid state. To this form the word "intrinsic" is applicable, particularly as much of it today is of the patient's own making. The term "extrinsic" may be reserved for disease which is definitely of external origin and caused by chemical, physical or microbial agents. There is no sharp line of demarcation between the two forms and, as disease progresses, it appears to be more and more primarily of intrinsic origin. Indeed, *there is only one disease* and, when external agents can be incriminated, it is rather with the augmentation of intrinsic disease than with the newly generated extrinsic disease that we are faced.

Intrinsic disease is tremendously widespread today. One might safely say that, among civilized peoples, it is rare to find completely healthy individuals. This is due to disease having become congenital, in addition to being inherent. In making this distinction I want to emphasize that the changes of dehydration and hydration are already taking place *in utero*, and bear fruit after birth in the form of disease considered to be entirely of extrinsic origin. The chief manifestation of such disease is chronic intestinal intoxication, and this completes a vicious circle. The reasons why chronic intestinal intoxication looms largest in the picture are because the vagus, the nerve supply of the intestinal tract, is damaged *in utero* and because this damage is augmented by food and insufficient elimination of its waste products during life. The vagus is the part of the brain selected for attack because it is the representative of the

esophageal ganglia (the beginning of all nerve matter), which make their first appearance in the rotifers.

Protein particles in the plasma, which have become hydrated as a result of intrinsic disease and are not undergoing further dehydration and re-hydration, retain sufficient of their activity to keep them in the colloid state without fear of precipitation, and their Brownian movements remain active. These particles may reach a considerable size, and as they are not losing electricity they become, as it were, "supercharged." Such particles may interfere with the colloid systems of the fixed tissues and cause condensation and loss of activity, just as those particles which are too poor in activity may do. The cell system to be attacked by these supercharged particles varies with the degree of hydration that has been reached.

The Cardio-Vascular System

The system that most commonly suffers is the cerebro-cardio-renal system. In this paper I purpose to limit attention to the damage done to the cardio-vascular system, because that sustained by the brain requires a paper to itself, embracing as it does every abnormal activity of the cerebral cells. In the case of the cardio-vascular system, defects of which are definitely on the increase, the hydrated protein particles attack the endocardial cells in the region of the mitral valves and the auriculo-ventricular area on the left side, and they are particularly liable to attack the intima of the aorta at its root. The intima undergoes first hypertrophy and later atrophy, and the hydrated particles pass through it to reach the elastic lamina. Protein particles hydrated to this extent have their fat moiety highly developed, and they are rich in calcium. The particles lodged in the intima and endocardium, unable to return to the blood-stream, tend to break down; cholesterol esters are set free, and later fatty acids. The sterols constitute the fatty infiltration and the fatty acids form insoluble calcium soaps, which later break down into calcareous deposits.

While these changes are going on in the heart and aorta, the hydrated protein particles elsewhere in the circulation cause hypertrophy of the intima and of the sub-endothelium of the smaller arteries. A condition of hyperplastic sclerosis is caused which may, in process of time, proceed to atrophic sclerosis or "arteriosclerosis," as it is more usually called. The name, "*thrombo-angiitis obliterans*" has been given to one form of hyperplastic sclerosis. Arteriosclerosis may arise without being preceded by the hyperplastic form.

That these processes may be congenital, is shown by the fact that arterial degeneration is sometimes present in the fetus. For in-

stance, posterior lens cataract is the result of damage sustained by the *Tunica vasculosa lentis*, while the hyaloid arteries are still patent.

Against this background of arterial degeneration, a number of conditions may arise as a result of changes taking place in the freely circulating protein particles. The hydrated protein particles circulating in the blood-stream may be split up, and in the process some of the "planets" will be set free or be deposited in the tissues. One may picture that, of the various "planets," some are more loosely attached to the protein core than others. The first "planets" to become detached are the salts; then come sugar, urea, fat and, finally, individual amino acids. Thus superficial dehydration will detach calcium and other salts; further dehydration will set free sugar into the blood-stream; still more penetrating dehydration will detach the urea fragment; while the fat moiety is usually the last to be set free before the molecule is finally broken up altogether.

The degree of dehydration that sets in is dependent upon the degree of hydration already present, whether it is pure hydration, or re-hydration, and upon the forces which are causing the dehydration. When the hydration is pure; i.e., the particles have never been subjected to dehydration before, as is often the case in intrinsic disease, the particles are rich in fat. Consequently, when the particles are broken up, myriads of tiny particles are to be seen in the ultra-microscopic picture and the "planets" most readily liberated are sugar, ketone bodies and cholesterol esters. The more often the particles have been subjected to previous dehydration and re-hydration, the fewer are the particles to be seen in the ultra-microscopic picture and, in these cases, the "planet" most readily liberated is urea. When the hydration is less marked, calcium is liberated and the clinical conditions associated with this change are scleroderma, *ostitis deformans*, etc.

The action of the various forces causing dehydration can occasion all kinds of combinations, and whether the freed "planets" remain in the blood-stream or are excreted in the urine depends upon the exact nature of the chemico-physical changes the protein particles are undergoing. So long as the freed "planet" retains its colloid characteristics and remains part of a combination, it tends to become deposited in the tissues and does not find its way into the urine. This is the explanation of the xanthoma papules and the chalky deposits in gout.

The Diabetic Syndrome

I should like to refer briefly at this stage to the diabetic syndrome. Renal glycosuria, alimentary glycosuria and *diabetes mellitus*

are differing manifestations of one and the same process. These conditions are all the result of the dehydration of intrinsically hydrated protein particles and in the three conditions the dehydration is of varying severity. In renal glycosuria the sugar set free from the split protein particles is rapidly excreted and does not collect in the blood-stream. In alimentary glycosuria the sugar only collects above the normal percentage after a carbohydrate meal, as at other times the tissues can take up the sugar which is set free from breaking down particles. In *diabetes mellitus* the particles are very much more hydrated to begin with, and when dehydration sets in it is correspondingly more penetrating and widespread. Sugar is set free in such quantities that neither excretion nor the needs of the tissues can keep pace with it. Sugar therefore collects in the blood and is also excreted in the urine. In severe diabetes the fat moiety is attacked and ketone bodies are present in the blood-stream. In the most severe form of diabetes, juvenile diabetes, lipemia is a feature; whereas, in more elderly people, cholesterol esters are liberated and these may be deposited in the tissues, giving rise to *xanthoma diabeticorum* and *xanthoma tuberosum multiplex*.

I do not believe that any of these conditions can be said to be due to disease of the pancreas. I dare say that the islet cells of the pancreas are particularly liable to be attacked when hydrated protein particles in the blood are undergoing rapid dehydration, and I would say that the diseased areas sometimes found *post-mortem*, in the pancreas of diabetic patients, are the result, not the cause, of the condition. The cause, I am convinced, lies in a certain type of intrinsic hydration—usually congenital—giving place to dehydration in the manner described above.

Action of Insulin

But the fact that diabetes is not, in my view, due to disease of the pancreas does not mean that insulin is not a very valuable remedy in this condition. Its mode of action, however, is not a specific one on carbohydrate metabolism, as most people think. Its action is, first, to cause dispersion of the hydrated protein particles, which are then able to take up some of the freely circulating sugar; and, second, temporarily to suspend the process of dehydration, which is responsible for throwing large quantities of sugar into the circulation.

The reason that insulin is the most effective drug we have yet discovered for the palliation of diabetes lies in the large size of its molecule, in its being of protein origin, and in that it is dependent upon negatively charged nitrogen atoms for its action. Insulin is probably a polypeptide of the amino acids histidine, arginine and cystine. Bodies of large

molecular weight have a marked action in the lowering of surface tension, and therefore they are able to exert an action close to the core of hydrated particles. Where particles are markedly hydrated and "supercharged," as in diabetes, they exert a high surface tension, and therefore are acted upon only by bodies of high molecular weight.

This view of the action of insulin led me to make use of it in other conditions in which the protein particles have been markedly hydrated and are being subjected to dehydration. I have had great success with it in some of the *sequelae* of syphilis, an infection which causes profound hydration, such as perforating ulcer, Charcot's arthropathy, spontaneous fracture and other trophic lesions. The drug is also invaluable in cases of scleroderma, sclerodactylia and *osteitis deformans*. Indeed, it is invaluable in all cases marked by a hypercalcemia. The drug is also of the greatest use in some of the toxemias of pregnancy.

Vascular Disorders

But to return to the subject of arterial degeneration, which forms the background of diabetes, as of many other conditions. If the type of change that has taken place has resulted in much narrowing of the lumen of the smaller vessels, it sometimes happens that the large, hydrated protein particles are arrested, either in the vessels themselves or in the perivascular lymphatics, in such quantity as to impede the circulation locally. If this takes place in the brain, a transient hemiplegia or amaurosis may result; if in the coronary circulation, it may give rise to an attack of angina; if the arrest is in the extremities, the condition which has been described as "intermittent claudication" may ensue.

If the arrest of particles is severe it may result in a fatal stroke or a fatal attack of angina; while in a limb it may cause gangrene. If the arrest of particles is general in the nervous system, the patient will pass into a state of coma, such as not infrequently terminates diabetes.

Now if hydrated particles are being subjected to repeated cyclical changes of dehydration and re-hydration, they will lose activity with each cycle and the type of disease that arises will be determined by the change wrought. If dehydration prevails, inflammation will set in and the various forms of arteritis will be produced. Among the earliest signs of arteritis are those involving the integument; e.g., premature baldness, rheumatic nodules, Dupuytren's contracture, *induratio penis plastica*, panniculitis, dermatomyositis and so-called "Kussmaul's disease."

So long as the dehydration remains comparatively superficial and does not penetrate further than the "planet" sugar, the arteritis is simple and of the form which is supposed

to be characteristic of diabetes — diabetic retinitis. But this form of retinitis may occur in other patients, which shows that it is not dependent upon the diabetes, but on those blood changes which very often give rise also to hyperglycemia, glycosuria and other signs of diabetes.

When the dehydration is more penetrating and the re-hydrated particles are consequently more readily precipitable, precipitation takes place in the perivascular lymphatic spaces. This is followed by leukocytic infiltration and damage to the surrounding tissues. It is these changes, taking place around the retinal arteries, which cause the white lines and areas which are seen in so-called "albuminuric retinitis." But here again, the name is not a good one, as this type of retinitis may be met with in a diabetic and in other cases in which there is no proteinuria.

The degree of hydration depends, as we have seen, on the depth of penetration of the preceding dehydration; and with each re-hydration the particles become more precipitable. Now different degrees of hydration seem to be associated with precipitation in different areas of the body. When the hydration is of moderate degree, precipitation seems to take place chiefly in the veins, and the organs mainly attacked are the lungs. Here the pulmonary arteries are involved which, in these organs, take the place of veins. Precipitation of particles of this type in the lungs is probably the first occurrence in most cases of pneumonia, and invasion by the pneumococcus and other micro-organisms is secondary.

Precipitation of this type may be followed by the cyclical change of **gelation**: that is to say, the particles become so bulky, in proportion to the fluid medium in which they are suspended, that the phases change places and the liquid phase becomes the dispersed phase. When this occurs, the vessels involved become thrombosed. The process may be repeated in veins in other parts of the body, but each new lesion arises *de novo* and is not the result of extension of the clot nor the detachment of a portion which lodges elsewhere. As stagnation of the blood flow is one of the causes of migrating thrombosis, the patient should never be confined to bed. Particles which are more hydrated, but nevertheless are arrested in the lungs, undergo precipitation in the perivascular and peribronchial lymphatic spaces, to produce the clinical picture of pulmonary edema, a condition which is even less often microbic in origin than is pneumonia.

Particles that are purely (intrinsically) hydrated mostly select the skin and its supporting structures. More markedly hydrated particles are precipitated in the portal area; whereas those most markedly hydrated are precipitated in the brain, heart and kidneys.

In the cerebro-cardio-renal system, if the precipitation takes place in the lymphatic vessels and the capillaries undergo sufficient hardening as a result, the blood-pressures are raised. But, if the precipitation takes place in the capillaries, the blood-pressures are lowered, because these vessels undergo dilatation. In addition, their walls become more permeable, so that first red blood-corpuscles and then leukocytes and protein particles may pass through. It is these changes, taking place in the kidneys, which give rise to hematuria, proteinuria and the passage of casts. If dehydration is most marked, glomerulitis is the result; but when this gives place to re-hydration, tubular nephritis will arise. Similarly, in the heart, interstitial myocarditis will give place to degenerative myocarditis when re-hydration takes place.

The dehydration necessary to give rise to the type of hydration which will cause these changes penetrates fairly deeply into the particles, so that such conditions are often associated with a hyper-uremia and, if they result in death, the death is normally put down to uremia; but I believe that it is not the excess of urea which causes death, but the extension of the process present in the kidneys to the brain.

Coma or, as I prefer to call it, "cerebral shock," is always due to widespread precipitation of protein particles in the perivascular and perineuronic spaces of the brain, and this may be associated with hyperglycemia, as in diabetes, or with hyperuremia, as in nephritis, or may occur in the absence of either, when the condition is labeled "pseudo-uremia." Indeed, the last is produced when the hydration is most marked.

Female Sex Disorders

A similar chain of linked conditions is seen in the disorders of menstruation, pregnancy and the menopause. This chain connects extrinsic to intrinsic disease, because the fetus is an external agent and may act as an invader.

Girls, in whom the protein particles in the plasma are hydrated, menstruate late or may suffer from amenorrhea. When hydration is accompanied by dehydration, menorrhagia and dysmenorrhea are the rule. Marked hydration tends to produce sterility, and when this is corrected and the woman becomes pregnant she bears girls rather than boys. Broadly speaking, hydration leads to the birth of girls and dehydration of boys. This is well illustrated in syphilitic abortions and still-births. There is no infection where hydration is so marked as it is in syphilis and the fetuses of such patients are usually female.

Women who suffer from menstrual disorders are liable to have the uterus retroflexed, and this sets up cervicitis. Correction of the hydration may result in a rectification of the

womb when all manipulative procedures and the wearing of rings have failed. The cervicitis is not primarily an infective process and it should never be handled as if it were. In these cases a neurosis is also frequently present. In fact, retroflexion of the uterus, cervicitis and neurosis constitute a well-marked triad. The neurosis emphasizes the implication of the brain, and the genital lesions that of the cerebro-cardio-renal system, to which the genital tract teleologically belongs.

The toxemias of pregnancy arise from the cyclic changes the previously hydrated particles undergo at the hands of the fetus, which behaves as an external agent or invader. Both menstruation and pregnancy produce such changes in the physico-chemical state of the dynamic resistance that they might almost be classed as pathologic states. But, in any case, it is impossible to draw a sharp line of demarcation between physiologic and pathologic states.

Should the particles have been markedly hydrated before conception, the effect of pregnancy may be to cause dispersion, with the result that the patient's health is better than at any other time. In these cases the child is most likely to be a boy. But should dehydration instead of dispersion occur, *hyperemesis gravidarum* is liable to result. The vomiting is caused by the dehydrated particles becoming re-hydrated and being precipitated in the portal area. This is why the condition is so liable to end fatally with hepatitis. So long as the condition is caught early; i.e., the dehydration has not penetrated too deeply, it may be checked with insulin, whether the percentage of the blood-sugar is raised or not, for, as I have pointed out before, the action of insulin is to disperse protein particles that have reached a certain degree of re-hydration, and is not necessarily connected with carbohydrate metabolism. Care must be used, however, as in certain states of the protein particles insulin may accentuate the hydration and give rise to fatal precipitation in the brain. If there is any fear of this, dextrose or some other dehydrator (e.g., oxygen) should be prescribed with it.

It may happen that the appearance of clinical signs and symptoms is delayed until the particles have been re-hydrated to the point of being precipitated in the cerebro-cardio-renal system. When this occurs and the brain is the chief organ to be affected, the condition which results is given the name of "eclampsia." But eclampsia is in no way different, except in the nature of the invader, from any other condition in which the syndrome of high blood pressures, nephritis and cerebral shock is present. The cerebral shock of eclampsia is almost identical with that found in diabetic, uremic and pseudo-uremic

coma and also in insulin intoxication. Eclampsia cannot be separated from toxic myocarditis and nephritis. Indeed, all are intimately related and whether the brain, heart or kidneys bear the brunt of the attack is determined partly by the degree of the hydration prevailing and partly upon whether it has been repeated or not.

When the hydration is mild in nature, the precipitation takes place in the veins and pulmonary arteries, to produce thrombosis. It is interesting to compare the three toxemias of pregnancy with the action of metals and non-metals, because it shows so clearly that the system attacked is determined by the degree of hydration to which the protein particles in the plasma are subjected. Mild hydration causes thrombosis, frequently in the pulmonary area; early and therefore moderate hydration attacks the portal system and is evidenced by hyperemesis; late and severe hydration attacks the cerebro-cardio-renal system and gives rise to eclampsia.

Similarly, if the invader is chemical, metals with a small atomic nucleus, such as aluminum, cause mild hydration and the seat of disease is in the lungs; metals with a medium atomic nucleus, such as arsenic and manganese, cause moderate hydration and attack the liver; while metals with a large atomic nucleus, such as mercury, thorium and uranium, pick out the kidneys.

Non-metals, which cause the greatest degree of hydration of all chemotherapeutic substances when used in toxic doses, cause precipitation of hydrated particles in the brain and give rise to cerebral shock of exactly similar type to that found in eclampsia. When they act slowly they give rise to miliary inflammatory lesions, such as are found in syphilis. The lesion connecting the two is encephalitis, which does not differ from the form caused by the ultra-microscopic viruses.

It is highly probable that, in a normal pregnancy, labor is initiated by the cyclic change of hydration taking place. This would explain why hydration, appearing before its time, causes still-births, miscarriages and abortions. This view is also supported by the fact that one of the most powerful hydrators we know, histamine, is also a powerful oxytocic agent.

During the childbearing period, the protein particles are being constantly subjected to cyclic changes by menstruation and pregnancy, hence it is not surprising that women frequently present manifestations of disease at the menopause. Incidentally, it also explains why syphilis is a less severe infection in women than in men. The moment a glimpse of the climacteric manifestations is taken they are found to be replicas of those described as occurring in intrinsic disease. There are lesions of a rheumatic nature in the integuments. The vascular system is heavily in-

volved and the organs selected for attack are the brain, heart and kidneys. The blood pressures are raised or lowered, according to whether dehydration or hydration prevails and whether the precipitation takes place in the perivascular lymphatic vessels or the capillaries, and all forms of retinitis, myocarditis and nephritis may be encountered.

Prevention and Treatment

It is a logical step from the theory of disease which I have attempted to set forth, to regard drugs and other forms of therapy as having precisely the same type of action in the body as any other *invader*. The object of all therapy is to produce dispersion of the patient's dynamic resistance, and the fact that this is sometimes accomplished by an invader in the ordinary sense of the word is the basis of the malarial treatment of paresis and the use of Coley's fluid for certain sarcomas. It explains also the action of erysipelas in healing *lupus vulgaris*.

As we have seen, symptoms of disease, with the exception of pyrexia, are the result of damage done to the tissues by the hydrated protein particles, and the result of our therapeutic measures will depend on our success in causing dispersion of those particles. In deciding upon a line of treatment, we must consider the probable state of the patient's dynamic resistance at the moment, as treatment which will cause dispersion of particles that are at one stage of the cyclic change of hydration, may only accentuate the hydration if given when the particles are at a different stage. I will now, very briefly, give a few general indications for the use of various types of therapeutic measures.

When the hydration of the particles is recent and not too severe, positively charged chemotherapeutic bodies may be given, because their action is superficial and "electro valent"; that is to say, they act by virtue of one or more positively charged atoms. The positively charged hydrogen atoms liberated from such a compound as SUP 36* are very efficient. Di-valent and tri-valent metallic atoms, such as calcium and manganese, are often useful.

When a more penetrating action is required, metals of higher atomic weight, such as arsenic, bismuth and mercury, must be used. When the hydration is of long standing, negatively charged bodies (non-metals) are needed, because their action is deep. But these substances must be used with care, because the more penetrating the dehydration the more readily is it followed by hydration or re-hydration.

If it is necessary to produce dispersion in the shortest possible time, for instance in

the case of a threatened stroke, angina, etc., acetyl-choline should be used. The active part of this drug is the negatively charged chlorine atom, which, being free to take up any position in the molecule it chooses, acts almost instantaneously. When time is of less consequence, oxygen, carbon dioxide, iodine, sulphur, in the form of contramine, or dextrose may be used. Antimony has an action intermediate between the metallic and non-metallic groups.

When hydration reaches a certain degree, chemotherapeutic measures are inadequate, as the molecular nucleus is too small to give the compounds a sufficiently penetrating action and, if they fail to produce dispersion, the chances are that they will accentuate the existing hydration and may hasten a fatal termination. In cases of this type, insulin may be of value, but if this is inadequate, chemotherapy must give place to immunotherapy and, in the most desperate cases, the only hope lies in blood-transfusion.

So much for the mechanics of treatment and, particularly in extrinsic disease, good results may be hoped for. But I must reluctantly confess to believe that, so far as intrinsic disease is concerned, we medical men can do practically nothing in the way of "cure." We can, of course, alleviate symptoms; we may be able to retard, or even temporarily arrest, the morbid process that is going on; but a complete return of the damaged tissues to health is not to be hoped for.

There are, of course, many instances of more or less complete remissions in the course of intrinsic disease, but when this occurs I do not believe it is the result of the therapy we have applied; I believe that, owing to some fortuitous occurrence (it may be some mild intercurrent infection), the cyclic change of dispersion is brought about, with consequent improvement of the condition.

As I have said, I believe that by far the greatest source of the spread of intrinsic disease is the chronic intestinal intoxication from which the majority of civilized mankind suffers. The cause of this is to be looked for in our unnatural mode of life, our preference for living in smoky cities and taking insufficient exercise, but, most important of all, our preference for elaborately treated and overcooked foodstuffs. If we could diminish the incidence of this condition we should do more for the health of man than if we stamped out all the more truly extrinsic diseases that afflict our species. Since we are helpless to cure intrinsic disease once it has arisen, we must concentrate our energies on prevention; for intrinsic disease, and its psychologic counterpart, fear, are sapping the vitality of civilized man, and if we cannot stop their progress our race is doomed.

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*A symmetrical urea compound.

The Therapeutic Effect of Blood Transfusions and Hemotherapy

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THE therapeutic effect of a drug consists, according to McDonagh's idea, in its action on the physico-chemical balance of the blood and organ cells of the diseased body. The larger the molecule of the drug, the more constant is the effect. Molecules of a higher molecular weight stay longer in our organism than do those of a lower one. There are no more complicated molecules than those formed by the animal organism. These molecules have the further advantage of being exactly adapted to our organism and of being decomposed in a certain direction not forming any toxic products, if used in the same species. Their quantities are well balanced and do not exceed physiologic limits, when introduced slowly. This consideration gives us a new conception of the so-called "non-specific protein therapy," which also includes blood transfusions, hemotherapy and autohemotherapy.

A careful, detailed analysis of all the cellular and liquid parts of the blood, concerning their physico-chemical structure and their chemical compounds, was necessary,* in order to estimate their "dynamic value," which means their value for assimilation and dissimulation—anabolic and catabolic changes. All these processes occur beyond the metabolic changes, which we measure with our routine methods. Wright coined for these metabolic changes the significant expression "Micro-metabolism." I have studied these conditions with new methods, which will be published elsewhere. The physico-chemical constitution of the normal blood is well balanced, although the constituents have an entirely different chemical, as well as physico-chemical, structure and value.

1.—*The red corpuscles.* The main and most active constituents of the red cells are potassium, lecithin, the iron-containing hemoglobin and cholesterol. The action of the hydrophobic cholesterol counterbalances the hydrophilic lecithin, thus preventing lysis. The red cells, introduced into the recipient's blood stream, will first act by their peculiar surface, in which, according to the rules governing in colloid media, potassium and lecithin are aggregated. Many compounds, such as sugar (Bang), fat (Hammarsten), bile salts, creatinin, ammonium salts (W. Koch), xanthin bases and adrenalin, have a high affinity to lecithin, either forming chemical compounds or being highly soluble in this colloid. We understand that the introduction of a large

amount of red cells may be of high value.

The transportation of substances which are important for the micrometabolism, or of waste products of the body, to the proper places is only one of the advantages of blood transfusion. The potassium has a stimulating action on the heart muscle and acts, in colloid media, by stimulating the metabolic processes, as I have demonstrated. The iron has an effect opposite to that of the potassium; it would therefore counteract the effect of potassium. The two elements, however, have an entirely different solubility and are carried in different vehicles, thus acting on different areas. These areas are doubtless those of their optimum physiologic effect, as we introduce the elements in exactly physiologic proportions, concentrations and media. The iron, in the presence of lecithin, acts further as a potent catalyser, increasing cell respiration (Kovaliova). This has been demonstrated by the introduction of benzol in the presence of iron and lecithin. The benzol turned to phenol, an oxidation process not occurring in the absence of iron and lecithin. Both the iron and the lecithin stimulate the reproduction of red cells and of hemoglobin; the lecithin in the bone marrow, where it accumulates by its fat-solubility, the iron in the liver and spleen, by its powerful microanabolic action (conductor action of McDonagh).

2.—*The white blood cells.* The quantity of the introduced red cells greatly exceeds that of the leukocytes (622 times). Among the white cells there are 75 percent of granulocytes. Their introduction into the recipient's blood cannot be neglected. Their inner surface is very large by reason of the tremendous number of granules aggregated in a relatively small area. The disintegration of one granulocyte liberates myriads of granules, the surfaces of which become valid within a small area, dissipating gradually throughout the blood plasma and circulating through all the capillaries and lymph spaces. The disintegration of the protoplasm liberates the nucleus of the granulocyte (or lymphocyte). A true giant among the protein particles of the blood plasma, which we see, in the ultramicroscopic picture of serum, to be from 5,000 to 30,000 times their size, the negatively charged nucleus changes the physico-chemical, as well as the electric conditions of the surrounding area. This means a change of surface activity; new life; new conditions for absorption; new micrometabolic action. These changes become still more pronounced, as the breaking down

*Published in detail in Schmiedeberg's "Arch. f. Pharmakol.," 1933, now in press.

of the less resistant red cells precedes that of the leukocytes.

The disintegration of the red cells created exactly the opposite conditions. They are rich in water, in hydrophilic colloids (globulin, lecithin) and in potassium and are positively charged. The nuclei of the white cells are dehydrated, rich in hydrophobic colloids, potassium is entirely absent and they are negatively charged. The benefit of the physiologic balance is again evident. The quantities introduced are adequate to the needs of the organism. The nucleohiston of the nucleus is a stimulus for the leukocytes, causing leukocytosis (Schittenhelm and Bendix) and stimulating the lymph stream (Mendel, Underhill and White). This effect creates a continuation of the process—an increase of the number of white cells, followed by their destruction. The presence of the nucleohiston lowers the blood pressure, decreases the coagulation-time of the blood and increases the basal metabolism—benefits which may be desirable and may give new indications for the selection of the proper blood or for the proper preparation of the donor.

3.—*The blood plasma.* The blood plasma, introduced with the donor's blood, is not only the most proper physiologic vehicle, but it contains, besides water, very valuable electrolytes and non-electrolytes. One of their most striking actions is the diuretic influence. There are, however, other very striking and important physico-chemical micro-anabolic and micro-catabolic forces present in the electrolytes and the non-electrolytes of the plasma, which will be discussed in another article.

We consider the physico-chemical effect in this paper, which does not include the chemical effect of the different elements and compounds liberated from the donor's blood, such as the glycerophosphate derived from the lecithin, the metaphosphate derived from the nuclei, and last but not least, the phosphorus in its inorganic compounds, its affinity to bones and the nervous system and so on. One of the main advantages of the parenteral injection of blood, intravenously or intramuscu-

larly, lies in the fact that the chemical compounds, acting first as large molecules, are slowly decomposed, without producing sudden changes.

Summary

Blood transfusion and hemotherapy have not solely the effect of replacing the patient's blood corpuscles: They act as powerful pharmacodynamic stimuli on the assimilation and dissimilation (micrometabolism) of the recipient's organs. They act by their physico-chemical compounds (hydrophilic colloids, lecithin and hemoglobin) and their hydrophobic ones (cholesterol and nucleoprotein). They act by the physico-chemical forces of their electrolytes, such as iron and potassium salts, and non-electrolytes, such as urea and sugar. Their action is exactly adapted to the needs of the human body, as their compounds are well balanced, present in the quantities desirable for the human organism, and administered in the proper vehicles.

We learn from these facts that the indications for blood injections may be much wider than just in emergency cases. We further learn that, by a proper preparation of a donor, his blood may become more valuable for certain patients. The method of blood transfusions, and especially of the intramuscular administration of human blood, can be improved by a careful study of the physico-chemical condition of the patient's blood, by the selection of donors of certain qualities, and even by the indirect treatment of the patient through the donor's blood.

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TEACHERS

A thousand teachers in technic for one in the spirit of things; innumerable voices lifted in fly-dronings of instruction how to fill the bin and the brain, the bank and the bourse, for one who laughs and plays and dares to watch the world go by.—WILL LEVINGTON COMFORT.

Micrometabolism and Its Clinical Application

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TO the clinician, metabolism is a broad term, describing tissue activities whereby growth occurs, function is maintained and waste products discarded. Anabolism describes the constructive, catabolism the inverse or retrograde phase, the algebraic sum of the two activities representing the metabolism. While certain disorders are called metabolic diseases and the term pathologic metabolism is used, there is still a feeling that the disordered metabolism, in a general way, is associated with the disease rather than constituting the disease itself.

Patients in whom catabolic activity predominates often show gross manifestations, such as loss of weight, fever, acceleration of the pulse rate, glycosuria, hypertension or increase in the metabolic rate as measured by the oxygen consumption. While the interpretation of these predominating findings engrosses the attention of the physician, a host of antagonistic or defensive mechanisms are being mobilized. These constitute the anabolic response, and while for a time they may give no outward signs nor definite symptoms, in time, and particularly when they predominate or localize, they are responsible for many pathologic manifestations. The regulatory mechanism of the tissues, tissue fluids, lymph and blood is so comprehensive that excess catabolic activity in one area is compensated by an active anabolic reply in another and a confusing clinical picture results. Moreover, because of their constructive characteristics, these anabolites tend to accumulate in the body fluids and are, in part, eventually deposited in the tissues, particularly those in which circulation is retarded, oxygen tension is low, or where previous injury or pathologic changes have lessened cellular activity. Many results of focal infection are examples of this perverted anabolic activity, the deposited products inciting vicarious response.

Closer study of tissue activity is desirable, but of necessity must be made by indirect methods applicable to the blood, which most closely approaches the tissue fluids and transports the various metabolites.

By the use of several well established methods, first utilized extensively by McDonagh, of London, a very rational concept is obtained concerning many disease processes which have heretofore been baffling. As the ultramicroscope or dark-field examination of the serum is used, the term *micrometabolism* is coined, because it gives a more intimate insight into the visible activities of the col-

loidal particles of the serum and of some of the cells. Physical measurements are utilized, together with chemical estimation of the metabolites, with the result that both anabolic and catabolic processes can be quantitated.

Clotting, Sedimentation, Refractility and Viscosity

Venous blood from the arm is drawn with a dry syringe and with minimum negative pressure. When allowed to coagulate, the appearance and size of the clot and the quantity and color of the serum often indicate the predominating activity of the organism. A small, retracted, firm clot, with a relatively large amount of highly-colored serum, is often found where catabolism predominates. In extreme cases, lysis of the erythrocytes results in a reddish serum. On the other hand, where anabolism rules, the clot is large, gelatinous, does not retract well and the serum is scanty and light-colored.

The sedimentation rate, long forgotten and again brought into use, becomes more valuable as an adjunct measurement of metabolic intensity. Rapid in acute infection or intoxication, it is likewise rapid in carcinoma with metastases. Its rapidity is associated with metabolic overactivity, as in fevers: a prolonged sedimentation rate is comparable to the period of hypothermia which follows fever. This difference should be emphasized, however; that the return of the sedimentation rate to normal is much slower than that of the temperature, and the prolonged sedimentation rate (a sign of anabolism) may follow months afterward. A lengthening of the sedimentation rate is found in many allergic states.

The refractometric index of the serum, obtained after allowing the venous blood to clot at room temperature in a dry, sterile container, using preferably the Abbe refractometer, provides a physiologic constant comparable to the pH of the blood and the temperature of the body. Coupled with this is the estimation of the viscosity of the serum, for clinical purposes by means of the Hess laboratory type viscosimeter at a temperature of 25° C. By these measures we estimate the relative amount of protein and its state of aggregation.

Acute lysis (catabolism), resulting from infection or intoxication, depresses the refractometric index (RI) by sending some of the proteins into solution. Not infrequently the viscosity (V) is lowered to an even greater degree than the RI, because the protein particles are smaller and their water envelopes

are less marked. As the size of the particles and the thickness of their surrounding adherent water covering regulate the viscosity (the greater the size and the larger the envelope, the more viscid the serum), it is logical to infer that any lytic process will affect the surface of the protein particles earlier and to a greater degree than the central portion. As the viscosity depends upon these more external factors and the refractometric index upon the amount of protein and number of particles, this may explain the frequent disparity between the two indexes. This has been worked out by Schulhoff, of Chicago, who has evolved the V/R index, which is normally 100; less if the viscosity is diminished to a greater degree than the refractometric index; above 100 if the viscosity is higher in proportion to the RI. As an aid to prognosis and in the management of both acute and chronic infections, this is a most valuable aid.

The ability of the blood to maintain its integrity is remarkable, as shown by its retention of chlorides when hoarded by a pneumonic lung, its remarkable acid-base mechanism, its almost constant pH and its conservation of protein, together with sufficient water to maintain an osmotic pressure compatible with life. In the presence of long continued intoxications or infections, especially those due to Gram-negative organisms, the anabolic response is most marked. The globulins and lipoglobulins predominate. They adsorb metabolites, bind water, are inseparable from many antitoxins and are involved in most immune reactions. They are less soluble and more easily precipitated than albumins and, because of this ease of precipitation, often instigate secondary pathologic processes. Eventually the effect upon the refractometric index is to raise it: the viscosity increases, frequently proportionately more than the RI, in which case the V/R index of Schulhoff is greater than 100.

Dehydration and Hydration

The separation of water from and the addition of water to the proteins prompted McDonagh to use the terms dehydration and hydration. While convenient, they do not convey the broad idea that, together with the separation and attachment of water, a large number and variety of metabolites are also being detached or conjoined. He makes this very clear in his various texts and, while workers in this field criticize his terminology, they find it difficult to substitute better terms.

It must be kept in mind while estimating the gas content (O and CO₂), the bases and acid radicals united with them, such as Na, K, Ca, Cl, PO₄, and the important organic blood constituents—glucose, urea, uric acid, creatinine and lipoids—that during the catabolic phase these may be separated from blood protein and tissues along with water, the protein

substrate even undergoing lysis, the fats saponification, and even the bones losing their mineral content. Here the products of tissue, organ and blood activity are on the way to the port of excretion.

When the anabolic cycle predominates, some of these substances which have been detached from one area unite with the lipoglobulins and are finally absorbed in another field. Our bodies are conservative and second-hand metabolites undoubtedly enter into many of our organs. A single injection of insulin can, not only lower the amount of free glucose in solution in the plasma, but diminish the lipid content and calcium by turning them back into combination with the protein of the blood and eventually the tissues.

The blood stream is a multi-lane highway, with traffic in both directions. Evidence of this may be found even in venous blood, in which excretory products naturally predominate. When lysis, dehydration or excess catabolic action predominate, the amount of one or many of the various metabolites is usually above the average. When anabolism rules, the blood proteins become hydrated, metabolites are adsorbed and estimations of those remaining in solution show figures for some which are less than usual. The rise and fall of these values is not necessarily concurrent. A low figure for glucose (an anabolite) is frequently found with a heightened urea finding; or a rise in calcium with a lowered phosphorus content.

The question arises as to whether there is any visible evidence that the proteins undergo any of the changes mentioned above. Here I enter a controversial field, but study of the serum in the dark field, by means of the ultramicroscope, provides a wealth of information. The astounding activity seen emphasizes the fact that blood is truly a living tissue and that the plasma is more than an inert medium for the transport of cells and a solvent for the other constituents. Moreover, the trend toward solution or lysis, on the one hand, or aggregation on the other, is illuminating, particularly because it furnishes a rational explanation for many of the measurements applied, as enumerated earlier.

In stained smears, **platelets** are found, the origin of which is indefinite, having shapes which suggest pinched-off remnants comparable to the dough left when a housewife cuts out cookies. Whatever their source, they are collections of coarse colloidal particles, they tend to form aggregations and they are usually present in the number of a quarter-million per cubic millimeter. They stand midway between the cells and the colloidal aggregates seen in the serum when examined under the ultramicroscope. Cells and colloidal particles in the dark field frequently assume shapes similar to those of the platelets.

The Protein Particles

Serum from normal persons, examined a few hours after coagulation has taken place at room temperature, when viewed in a dark field with intense light, shows myriads of colloidal particles in active brownian motion. If leukocytes are present, the granules of their protoplasm exhibit this same activity.

The objection has been raised that freshly-drawn blood does not show this motion, nor does the first serum which exudes from the clot manifest as great activity as it does later, hence the finding has no relation to conditions inside the blood vessels. While this is true, we must not lose sight of the fact that coagulation clarifies the blood as egg does coffee. Not only that, but the coagulation removes a large proportion of very active protein, the fibrin. As the serum is expressed from the clot, the still-living proteins again take up their activity and show again their tendency either to go into solution or even further to induce gelation, if the catabolic urge is great, or to form larger particles, brighter because of their greater lipid content, and sluggishly motile if the anabolic influence is greater. These particles tend to huddle, agglutinate, form larger aggregations and to precipitate, either individually or in masses. The picture is a changing one but the tendency toward lysis or aggregation persists.

To recapitulate, then, by examination of the blood or its serum we may find either a process, catabolic in nature, evidenced by small protein particles, losing their brownian motion, going into solution leaving only a haze or cloud, or sometimes simulating gelatin. The sedimentation rate is short; refractometric index, viscosity and V/R index below average; and one, several or many of the metabolites excessive in amount.

The converse picture appears where anabolism is provoked, the ultramicroscopic picture showing larger, slowly-moving particles, which are brighter, often ring-like or with halos, huddled, agglutinated or precipitated; sedimentation rate lengthened; refractometric index, viscosity and V/R index greater than average; and one or several of the metabolites found to be less than normal when quantitated.

The two processes go on simultaneously and many factors influence the findings, sometimes producing a confusing picture. There may be a selective activity involving one of the chemical constituents more than the others (as glucose), or excretion of these chemical compounds or of water may alter their concentration. The lipoglobulin fraction may be deposited in the tissues and only the low chemical percentages or the high physical measurements remain to guide the clinician. A series of examinations is of utmost value in estimating the rate and degree of the pathologic process and the influence of therapeutic efforts toward its correction. Even more valuable is

the evidence which tells when to terminate treatment and so prevents overmedication.

Clinical Applications

In our daily work we are enabled to understand the action of many therapeutic agents by watching their effect upon the blood. The whole group of antipyretics affects the colloidal activity, often only temporarily. In prolonged infections due to staphylococci, manganese butyrate or symmetrical compounds of urea, when injected, restore more normal activity to the proteins, with resulting cure of the focal lesions. Preparations of tin, by mouth, and aluminum-potassium nitrate externally, often effect similar results. Quinine is of value, not only in malaria, but in pneumonia and influenzal infections, where it restores electrical changes lost by the protein particles. It exhibits a similar action when it modifies the pulse rate in hyperthyroidism; and the effect of an allied substance, quinidine, upon a fibrillating heart is still another example.

Many drugs increase catabolism and elimination. As long as the store upon which they draw is sufficient they produce satisfactory results, but when it becomes exhausted they accelerate the catabolic phase of the disease and are then not only detrimental but dangerous. *Digitalis*, the sheet anchor where a decompensated heart requires support, works best when water retention is present. It does not slow the pulse rate of hyperthyroidism and often fails in the myocardial insufficiency of pneumonia, because of the excessive metabolism already existent. If the dose is pushed beyond the point of tolerance, toxic effects, which are the result of acute dehydration, follow. Nausea, coupling of the beat and heart block may subside if the drug is discontinued, but every clinician knows the danger which is imminent were he to give *digitalis* intravenously while such symptoms were present or switches to another active dehydrating drug such as *scillonin*. When the RI, viscosity and particularly the V/R index are low, dehydrating drugs must be used with utmost caution, if at all. This applies to the use of isotonic salt and glucose solutions in surgical conditions, because they too have a dehydrating action.

A patient is subjected to a surgical operation. This may be necessary in the presence of or as a result of infection; at any rate, lytic agents influence his condition. An anesthetic is administered: more lysis is provoked. Following the operation, salt isotonic solution, glucose and *digitalis* are administered, all being dehydrating agents. When the proteins of the blood and tissues no longer tolerate this succession of catabolism-provoking agents, there result postoperative fever, falling circulation and, not infrequently, intravascular coagulation. If this occurs in the lung it is apt to be called postoperative pneumonia or, if

extensive, it may produce massive collapse of the lung.

The value of a large number of commonly used drugs depends upon their dehydrating action, and when administered beyond the point of tolerance, transforming the hydrated proteins of the blood into a state of dehydration, they produce unwelcome symptoms. Best examples are nausea and vomiting; drug rashes which follow bromides, iodide and barbitol preparations; jaundice or extensive liver damage after cinchophen; and neuritis after arsenic or emetine. A celebrated neurologist at Saint Elizabeth's hospital remarked several years ago that syphilitics treated by using mercury and iodides developed general paresis some twenty years after their infection, but after the more intense arsenical treatment he found the elapsed period much shorter and many full-blown paretics were being admitted seven or eight years after their initial lesion.

The various uses of ipecac are of interest. As the syrup, it is still a household remedy in croup; combined with opium, in Dover's powder, it was for years a much used drug in common colds, until narcotic regulation and new organic preparations eliminated it. Today, as emetine, it finds its use in amebic infections and colon disease, and is being incorporated into a proprietary preparation for treatment of gastric ulcer.

Even the effect of common salt is being better understood in its relation to metabolic activity. Long known to influence edema, its relation to many skin lesions, when used to excess or without other counterbalancing minerals, directs the interest of the internist toward dermatology. The need of salt in conjunction with corticin opens a new chapter in the relation of colloids to disturbed physiology.

The liberation of erythrocytes into the peripheral circulation in pernicious anemia, by administration of the recently discovered Addisonin, is an example of specific response to metabolic stimulation. Similar but less successful results have been obtained in granulopenia by the use of pentanucleotides and yel-

low bone marrow. It is of interest that, in one condition, the active granule-containing cells are missing, and in the other that the newly delivered reticulocytes differ in colloidal structure when distorted by certain strains. The appearance is quite the converse of that known as cloudy swelling.

Of the therapeutic agents affecting anabolism, Iletin is the outstanding example. Because of its source and effect upon blood glucose and glycosuria, the greater range of its activity was more slowly appreciated. Insulin edema, typical tissue hydration and the restoration of the obesity which so often precedes diabetes, emphasize its action upon water and fat metabolism. Insulin convulsions are comparable to those of epilepsy, cerebral syphilis or whisky fits, all associated with acute hydration of the brain. In the past few years the term hyperinsulinism has been applied to a syndrome which is, in reality, the result of perverted anabolism.

The use of insulin in tuberculosis, hyperthyroidism, hypertension and to aid or replace viosterol in the fixation of calcium in osteomalacia, is often followed by gratifying results. A preparation having less prompt but more prolonged anabolic action will probably supplant it in some states where vascular lesions predominate. This is the so-called tissue extract, obtained from blood, muscle or pancreas and having properties distinctly opposed to those of suprarenalin.

An appreciation of the metabolic responses of the sick, particularly if supplemented by micrometabolic study of their blood, will aid the physician in restoring them to normal.

Cancer is unquestionably the most extreme example of metabolism at the cross-road. On the one hand, the neoplastic mutiny of cells, primarily a growth response and not a degeneration, progressing until the cellular aggregates are crowded through their limiting membranes and free to be transported to new territories; on the other hand, the excess catabolism which, unable to compensate the strain imposed upon it, finally results in cachexia and death.

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THE PHYSICIAN

I remember an ingenious physician, who told me, in the fanatic times, he found most of his patients so disturbed by troubles of conscience, that he was forced to play the divine with them before he could begin to be the physician; whose greatest skill, perhaps, often lies in the infusing of hopes and inducing some composure and tranquillity of mind, before he enters upon the other operations of his art. This ought to be the first endeavor of the patient, too, without which, all other medicines may lose their virtue. In all diseases of body or mind, it is happy to have an able physician for a friend, or discreet friend for a physician.—SIR WILLIAM TEMPLE

Relation of the Schilling Differential Count to the Physico-Chemical Status of the Blood Colloids

By F. Le Blanc, B.L., M.D., Elgin, Illinois

THE circulating fluid in blood vessels consists of two portions: the plasma or liquid portion, in which is suspended the other portion, consisting of formed elements, including cells and parts of cells.

Arneth, Schilling, Piney and others have studied especially the latter and have evolved an interesting and valuable clinical system, which is proving more and more reliable in the control and prognosis of certain diseases.

However, J. E. R. McDonagh, of England, has been interested mostly with the first portion, including the neglected hemokonia, which seem to be the materials upon which depends the life and function of the formed elements of the blood, as well as of the cells constituting the body as a whole.

It would be well to read Ludlum's article on the *Chylomicron Emulsion*¹, in order to understand the construction of these particles and their influence on the body-cell colloids.

For those who have been interested in the study of the physico-chemistry of the blood colloids along the lines originated by McDonagh, certain activities of the various white blood cells have shown interesting behavior under the ultra-microscope or dark-field examination. The micellae of these individual cells have struck the observer's attention as showing various stages in their Brownian movement, their amoeboid motion, or their disintegration. During this latter process, cells which are seen to be filled with many small granules or globules, each of which, after escaping from the cell, remains discrete and refractile, appears white and luminous and may be found swimming in several fields under examination, must not be confused with the hydrated particles described by McDonagh. This is observed especially in bloods undergoing some dehydration or dispersion.

While this is occurring under the dark-field illumination, certain other factors can be observed in the Arneth index, Krebs's leukocytic index, and the monocyte-lymphocyte index, which apparently are secondary to the Schilling differential findings. Arneth gives the proportion of polymorphonuclears in normal blood as follows: containing one nucleus, 5%; two nuclei, 35%; three nuclei, 41%; four nuclei, 17%; five or more nuclei, 2%. The Arneth index is obtained by adding the sum of the first

two classifications, plus half of the third, which gives a normal factor between 60 and 62.

The leukocytic index of Krebs is acquired by dividing the sum of the neutrophils by the number of lymphocytes, which gives normally an index of 3.

The monocyte-lymphocyte index consists in dividing the sum of the lymphocytes by that of the monocytes, and gives roughly an index of 3.

Naturally these factors are more or less labile; however, if the routine examination of them is consecutively followed, one cannot help feeling that a certain relation seems to obtain in the cases where hydration or dehydration are respectively active in the colloids of the blood plasma.

Where hydration and dehydration often are concomitant, these indexes have given assistance in the correct interpretation of what is going on in the physico-chemistry of the blood and have helped to elucidate certain ambiguous situations. The following cases, observed in the Elgin State Hospital, are detailed with the purpose of showing the importance of the above data in arriving at proper conclusions concerning the effect of treatment in modifying the physico-chemistry of the blood colloids.

The Schilling differential counts are not reported in detail, but have been made the basis by which to figure the Arneth, Krebs, and the monocyte-lymphocyte indexes.²

In acute diseases, the appearance of the monocyte has been considered as a sign of improvement and the lymphocyte as one of recovery. However, McDonagh considers them as features of hydration; whereas neutrophilic leukocytosis is concomitant with dehydration during the active infectious process.

In observing the relation between states of dehydration and hydration, respectively, it appears that the above indexes reveal the true picture when the McDonagh report is at times confusing and ambiguous.

The first case shows the effect of sulphur in oil, given intramuscularly, which is a dehydrating agent, as evidenced by a shift to the left (increase) in the Arneth index, a rise in Krebs's leukocytic index, a lowering in the

1.—Ludlum, S. DeW., Taft, A. E., and Nugent, R. L.: "The Chylomicron Emulsion," Colloid Symposium Monograph, Cornell University, June, 1930.

2.—Sullivan, M. and Jones, P. H.: The Value of Monocytic Lymphocytic Index Determined by Supravital Technique Before and After the Administration of Tuberculin. *Am. J. Med. Sc.* 185:762, June, 1933.

monocyte-lymphocyte index, an increase in the rapidity of the sedimentation rate, a lowering of the refractometric index and the viscosity, and a lowered viscosity-refractometric (V. R.) index. The ultra-microscopic picture also shows the dehydration picture.

Before Sulphur (Hydration)		After Sulphur (Dehydration)
Arneth Index.....	40	60
Leukocytic Index...	2.8	5
Monocyte-Lymphocyte Index.....	8	2.1
Sugar	70	70
Urea	36	32
Sedimentation Rate	4 hrs.	2 hrs. 50 min.
Refractive Index...	1.3496	1.3480
Viscosity	1.8	1.65
V. R. Index.....	107	90
Ultra-microscopic Picture:		
Great paucity of moving particles, with occasional giants and giant-particled clumps. Several of the above precipitated.		
Many moving particles, consisting of sub-micronic, large, giants, and large-particled clumps. Individual precipitation of large and giant particles.		

The second case is of interest in that it seems to agree with the McDonagh observation that, given a blood undergoing dehydration, hydration will result if further dehydration is created by the administration of a dehydrating agent.

This patient had ionic calcium given intravenously, with the result of dehydrating her initially hydrated blood. Sulphur was next given, with the picture changing to one of hydration again, evidenced by a lowering of the Arneth and Krebs indexes, a higher monocyte-lymphocyte index, a higher refractive index and a higher V. R. index, in spite of the fact that the blood-sugar, sedimentation rate and ultra-microscopic field still showed the previous state of dehydration.

After Calcium (Dehydration)		After Sulphur (Hydration)
Arneth Index....	76	73
Leukocytic Index.	3.3	1.8
Monocyte-Lymphocyte Index.	2	2.8
Sugar	55	70
Urea	20	not done
Sedimentation Rate ..	5 hrs. 30 min.	2 hrs. 5 min.
Refractive Index...	1.3478	1.3493
Viscosity	1.65	1.65
V. R. Index.....	88	94
Ultra-microscopic Picture:		
Fair number of giant and giant-particled clumps. One ringed particle. Precipitation of refractile agglutinations.		
Fair number of moving particles, consisting of many normal, a few large, and occasional giants. Few individual large and giant particles precipitated.		

This case also recalls a statement made by McDonagh that the action of drugs is governed by the state in which the protein particles happen to be at the time of administration.

The next case shows the interesting action of auto-hemic therapy, followed by Spengler's immune blood, which in this case corrected the hydration produced initially by insulin in a tuberculous patient.

After Insulin (Hydration)		After Above Therapy
Arneth Index....	61	90
Leukocytic Index.	2.3	6.9
Monocyte-Lymphocyte Index.	3	5
Sugar	64	84
Urea	40	not done
Sedimentation Rate	20 min.	1 hr.
Refractive Index...	1.3518	1.3460
Viscosity	2.3	1.6
V. R. Index.....	123	82
Ultra-microscopic Picture:		
Very many moving particles, consisting of large, giant, and large-particled clumps. Individual precipitation of small, large, and giant particles.		
Fair number of moving particles, mostly sub-micronic, with occasional large giant, and neutrophilic micellae. Individual precipitation of many large and micellae.		

Apparently the above therapy improved the sedimentation rate and caused some dispersion, as clinically the patient greatly improved.

The fourth case shows the effect of the dehydrating sulphur agent on the blood of a patient who revealed the so-called gelatohydration of McDonagh, with hydration predominating in the first picture and dehydration in the second.

Before Sulphur		After Sulphur
Arneth Index...	34	44
Leukocytic Index	2.2	4.8
Monocyte-Lymphocyte Index.	3.2	5.2
Sugar	73	62
Urea	40	20
Sedimentation rate....	4 hrs. 25 min.	45 min.
Refractive Index...	1.3492	1.3480
Viscosity	1.65	1.7
V. R. Index....	96	86
Ultra-microscopic Picture:		
Fair number of moving particles, with occasional large, small giant, and small clumps. Precipitated are several individual large particles.		
Fair number of moving particles, consisting of sub-micronic, several large, and occasional giant. Individual precipitation of many large particles, with many satellite small rings. Good Brownian movement of neutrophilic micellae.		

As seen in the above table, the monocyte-lymphocyte index, sugar, urea and viscosity show the effect of secondary hydration of some of the particles which were undergoing previous dehydration; however, the picture in the main shows dehydration being in the lead.

Following are three cases showing dehydration:

Case 29: Fatal pneumonia in a tuberculous individual.

Arneth Index	89
Leukocytic Index	7
Monocyte-Lymphocyte Index	0
Sugar	180
Urea	not done
Sedimentation Rate	25 minutes
Refractive Index.....	1.3478
Viscosity	1.75
V. R. Index	81

Ultra-microscopic Picture: Few moving particles, mostly large and small giants. Few giant-particled clumps. Poor Brownian movement of neutrophilic micellae. A few of the above precipitated.

Case 33: Following sulphur in oil.

Arneth Index.....	80
Leukocytic Index.....	7.7
Monocyte-Lymphocyte Index	3.3
Sugar	50
Urea	16
Sedimentation Rate	30 min.
Refractive Index	1.3488
Viscosity	1.75
V. R. Index	87

Ultra-microscopic Picture: Paucity of moving particles, with a few large and giants. Occasional large agglutination; individual precipitation of large and giant particles, with an occasional giant-particled clump.

Case 19:

Arneth Index.....	69
Leukocytic Index.....	14.5
Monocyte-Lymphocyte Index.....	2
Sugar	90
Urea	not done
Sedimentation Rate	45 minutes

Refractive Index.....	1.3475
Viscosity	1.6
V. R. Index.....	87

Ultra-microscopic Picture: Practically nothing seen moving, except occasional large and giant particles. Few individual large and giant particles precipitated.

Hydration predominates in the three cases tabulated together.

Case 17	Case 20	Case 23
A. I. 45	55	74
L. I. 1.5	2.5	2
M. L. I. 5.3	6.6	4.2
Sugar 72	118	78
Urea 40	not done	32
S. R. 45 min.	1 hr. 20 min.	4 hrs.
R. I. 1.3517	1.3520	1.3501
Viscosity 2	1.9	1.75
V. R. I. 108	100	95
Ultramicroscopic Picture: Many moving particles, consisting of sluggishly moving giants, large and giant particled clumps. Many of the above precipitated.	Myriads of moving particles, mostly sub-micronic, large and small giants. Occasional small clump. Sheet precipitation of large and giant particles.	Several particles moving, consisting of sub-micronic, large, several giants, and occasional large particled clumps. Very little precipitation.
Case of a physician with history of cerebral thrombosis three years previous.	Case of a physician with angina pectoris.	Case of multiple sclerosis.

This group of reports is representative of a series of 35 cases, which could be tabulated but have been omitted on account of limited space.

They all show the tendency of the neutrophils to increase in dehydration and of the lymphocytes and monocytes to increase in hydration and conduction, with the Arneth index shifting to the right (decreasing) in hydration and conduction, and to the left in dehydration.

There may occasionally be discrepancies in the above factors, which, however, can be explained when the tautomerism undergone by the protein particles is taken into consideration.

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NECESSITY FOR PSYCHIATRIC LEADERSHIP

The present age has brought with it complications in society which have resulted in conflicts affecting both classes and individuals. Where these conflicts seem to be of mental origin, they should be investigated and studied, just as the causes of physical disease are studied. This point of view has doubtless increased the public's interest in mental hygiene. In taking up this question of mental health, psychiatry is merely paralleling what general medicine has done in public health.

If this movement is not led by responsible leaders, the field will be left open to faddists and fanatics who foist their theories on the public, the same as quacks have succeeded in doing, at times, in the treatment of physical diseases. A moratorium in mental hygiene, as suggested by one of the aforementioned writers, would leave the field open to a group of charlatans.—DR. SANGER BROWN II, of Albany, N. Y., in J. A. M. A., Aug. 27, 1932.

Etiology and Treatment of High Blood Pressure

By Norman M. Smith, M.D., Minneapolis, Minn.

THE reason for my attempting to discuss such an important subject as high blood pressure is because of a desire to call attention to some practical applications of McDonagh's theories which I have made, and to prove that, in this condition, much can be done to remove the cause and to increase life-expectancy.

Blood pressure is influenced by age, sex, constitution, weight, occupation, race, altitude, sleep, anoxemia, exercise, menstruation, pregnancy, climacteric, posture, toxic states, acute disease, worry, fear, grief, anger, fatigue, mental work, pain, changes of temperature, physical strain, excitement, preversion of internal secretions, metabolic factors, overloading of the digestive organs, cerebral lesions and psychic factors. Heredity also is undoubtedly a factor, since many patients give a history of parents and grandparents with high blood pressure.

Alcohol is directly and indirectly potent in the etiology of arteriosclerosis. The daily drinker, who has a few cocktails before dinner, is treading the path which leads to high blood pressure; while, under pre-Volstead conditions, the day laborer, who drank up his weekly wage on Saturday night and started out on Monday morning as good as ever, probably did his arteries very little harm.

Drugs, such as tobacco, lead, aspirin and arsenic, are powerful elevators of blood pressure under certain conditions; and so are focal infections in any part of the body. In my opinion, a destructive intoxication is caused largely by intestinal conditions. Most of the time the causes mentioned are linked up with an intestinal intoxication due to ordinary constipation, putrefaction or intestinal stasis.

Blood chemistry studies and urine analyses, in a very large proportion of persons, show that absorption of toxins from the intestinal tract is going on; although the body may be poisoned by poor function of any organ of elimination—kidneys, bowels, lungs or skin.

McDonagh says: "The abnormal condition is due to an improper balance between the amount of toxic material engendered within the organism or absorbed by it and the amount of such material removed from the organism through the natural channels of elimination.

"It is also a fact that when this improper balance is corrected, either by lessening absorption or by increasing elimination or by both, the toxic state tends to disappear and the high blood pressure symptoms diminish in severity. The completeness of the relief of these clinical symptoms corresponds very

closely to the completeness of the correction of the toxicosis, as shown by laboratory findings."

As a basis for some of the treatment which I am about to suggest, I shall discuss briefly the function of the liver. This organ, by nature of its chemical activities, acts as a protective agent against poisons—not only alkaloids like strychnine, morphine, quinine, which experience a change in their chemical constitution by which they lose their poisonous properties, but also metallic poisons like iodine, arsenic and mercury, which are stored for long periods. In addition, bodies developed by the action of intestinal bacteria on proteid are transformed and their toxicity reduced or removed, and the toxic activity of poisons generated by such specific bacteria as typhoid, tetanus and others are undoubtedly antidoted.

I believe that high blood pressure cannot be successfully treated, regardless of its cause, without normalizing the liver and intestinal functions. If toxin is being absorbed from the intestinal tract or other sources and the liver kept over-active because of this extra work, more pressure must be supplied by the circulatory system in order to provide sufficient blood to complete the transformations and reductions just described. Otherwise the formation of the liver's internal secretion, glycogen, cannot be completed; ammonia salts are not converted into urea; bile, in which poisonous products are expelled, is not produced; and the general metabolism of the entire system is not properly carried on.

Treatment

McDonagh says: "When the hyperplexis has persisted for a very long time and there is capillary fibrosis and hyperplastic sclerosis of the arterioles and arteries, not much can be expected from treatment; but if the case is seen before this stage, it is extraordinary what can be done for the patient in the way of lowering the blood pressure." By the judicious use of iodine, contramine, thyroid extract, insulin, ichthyol, podophyllum and leptandra, over a period of time, cases with capillary fibrosis and hyperplastic sclerosis can be relieved.

In addition to the remedies mentioned, general treatment, hygienic measures and strict supervision of a patient are required, according to the demands of the particular case. If the occupation of a patient requires too-long hours, night work, or unusual responsibility, changes are made in business habits or a prolonged vacation is prescribed, to obtain mental and physical relaxation. Exercise may be necessary—walking, horseback riding, golf or

other outdoor sports. Muscular activity, unless contraindicated by some other condition, is important.

Obese patients may be reduced, depending on age, physical condition and amount of excess weight. Alcohol is absolutely forbidden and tobacco may be, if it can be done without setting up a nervous or mental irritation which may do more harm than the tobacco. Fluids, such as water, fruit juices and caffeine-free coffee, are not restricted; in fact, a definite quantity of water is prescribed—from three to four quarts in twenty-four hours. The diet is based, as a rule, on alkaline-producing foods, and meat, fish, chicken, eggs, asparagus, oatmeal, onions, mushrooms, tea, coffee and chocolate are forbidden, because of the purin bodies and other residue which follows their digestion. The intake of food is limited and excesses avoided.

If, as Allbutt says, "You can catch your hyperpiesia early," the relief of symptoms can more quickly be brought about; but early or late, a large percentage can be rendered symptom-free.

It is fundamental, if this problem is to be met successfully, to obtain all the information possible from the family and personal history and physical examination, the value of which is in direct proportion to the thoroughness with which the information is obtained.

The physical examination should be made as completely as possible. All special senses of the examiner are brought into active use; laboratory procedures are carefully carried out, including blood counts, blood chemistry studies, ultra-microscopic studies of blood serum, liver function tests, urinalysis, x-ray studies, etc. The many factors entering into the causes of high blood pressure require a painstaking study of the patient *as a patient*, in an attempt to make it possible for him to recover his health, disregarding for the moment the fact that he has high blood pressure.

The condition, high blood pressure, can be cured in direct ratio to the discovery of abnormal conditions present. If all abnormalities are known and can be corrected, as is usually the case, favorable results are assured. By intelligent application of principles here presented, the prognosis can be fairly definitely outlined to the patient, to the extent of securing his hopeful and hearty cooperation, which is probably helpful in obtaining results.

If, after discontinuing treatment, a patient strays from conditions laid down as proper hygienic rules for him to follow, if he is careless in habits of eating, drinking and eliminating, the same conditions which produced high blood pressure once will certainly produce it again. On the other hand, if he continues to keep his body as close to normal functioning as possible, by avoiding excesses, he will continue to keep his blood pressure down.

A reasonable number of patients with vari-

ous diseases in which high blood pressure was a symptom have been studied and treated, with such constant success that it seemed worth while to report them. If those who have taken the time to read this article will be equally diligent and patient in studying and treating their cases as outlined above, I am sure the results will be comparable and blood pressure cases with high mortality will be a thing of the past.

Case Report

The following case, typical of many others, is an illustration of the method under discussion. This patient, a woman of 68 years, with three adult children, illustrates one of those cases of high blood pressure where the arteriosclerosis involved the end capillary network of the kidneys and caused interstitial nephritis. The arteriosclerosis was due to chronic intestinal intoxication and involved the coronaries. She sought advice because of dyspnea, nervousness, vertigo, severe headache, swollen and painful feet and cramps in the thighs.

Her family and personal history were negative. Her blood pressure was 286 and 210, respectively, by the recording sphygmomanometer. An examination of the blood showed the following findings: Sedimentation time, 30 minutes; blood-sugar, 170 mgm. per 100 cc.; urea nitrogen, 31.5 mgm. per 100 cc.; refractive index, 1.3502; viscosity, 1.6/1 3.3/2.

Ultramicroscopic Findings:—Very few protein particles; frequent giant particles throughout slide. Particles were mostly precipitated, with very little motion. A few ringed particles and several white blood cells were seen, showing no motion.

Hemoglobin, 89.7 percent; leukocytes, 14,800; red blood cells, 4,450,000; differential—polymorphonuclears, 79 percent; large lymphocytes, 7 percent; small lymphocytes, 12 percent; eosinophiles, 1 percent; transitionals, 1 percent.

After a week's fast she was put on a restricted diet and given two tablets every four hours, each containing 1/10 grain (6.4 mgm.) each of podophyllum and leptandra, and iodine 1:500, in 2 dram (8.0 cc.) doses, every four hours. Once a week for four weeks she was given a hypodermic injection of Contramine, 0.125 Gm., followed by two doses, at weekly intervals, of S.U.P. 36,—a symmetrical urea of p-benzoyl-p-aminobenzoylaminonaphthol—3 : 6—sodium sulphate. Insulin, in 10-unit doses, followed the S.U.P.36 every seven days. During the first week, while on the fast, this patient took daily doses of one ounce (32.0 Gm.) of magnesium sulphate, and this was followed by similar doses weekly.

In three months the blood pressure was gradually reduced to 165 and 92, respectively; the urinary and blood findings were much improved, and she had no complaints. It is not expected that the kidney damage and impairment of the circulatory system will be elimi-

nated, but there is every reason to believe that her improvement will continue and her blood pressure will remain within safe limits.

Materia Medica of Remedies Used

Iodine is a condenser preparation which occasions dispersion of the enlarged and agglutinated particles. Colloidal iodine may be injected intravenously with advantage in many chronic conditions, in anhydremia, and for the purpose of overcoming insulin intoxication. Iodine is particularly indicated in endocrine cases where any of the ductless glands are involved, in suprarenalopathies (Addison's disease, hypoadrenalism, hypoparathyroidism), pituitary disease, pineal gland disease, parathyroid gland disease, disease of the spleen and hyperthyroidism.

Podophyllum peltatum (May apple) is useful in many conditions of the intestinal canal in which the liver also is involved, as in chronic hepatitis, catarrhal jaundice, acute yellow atrophy, sclerosis and chronically congested liver.

Leptandra virginica improves liver conditions, including jaundice with general intestinal indigestion.

Ichthyol is of value in certain types of neurasthenia; also in anhydremia.

Thyroid extract stimulates hepatic function and is useful in various nutritional phenomena; in self-protective or immunizing functions, when it is necessary to neutralize or destroy toxic substances found in disturbed metabolism, myxedema, eczema, chronic rheumatic conditions, pemphigus, urticaria, psoriasis, nephritis, chronic intestinal autotoxemia and anhydremia.

Contramine, or diethyl-ammonium diethyl-

dithiocarbamate, is an organic sulphur compound. It is a typical example of a chemotherapeutic drug and is of value in the treatment of chronic infections, chronic intoxications and in the chronic complications of acute conditions.

The use of *insulin*, a hydrator, covers a much wider area than that taken up by the sugar problem. In diabetes with high blood pressure, insulin is of advantage because it corrects the dehydration. There is a fall in the percentage of blood-sugar, due to the increase in the size of the protein particles in the blood serum, which have taken up urea, sugar, salt, etc. In non-diabetics with high blood-sugar and blood-calcium; in osteitis fibrosa and adenoma of parathyroid glands; in acute angina caused by chronic colitis with dyspnea, it is also of great value.

In glomerular nephritis it is unusual to find a low blood-sugar and blood-urea. The specific gravity and refractive index of the urine are low. Here insulin is indicated because it makes the blood plasma more liquid, the vessel walls more elastic, and vascular dilation results. If the large capillary network is fibrosed, much time is required before this resistance of blood flow can be broken down, but insulin will contribute much to bring about normal function of small blood vessels. Insulin is also indicated in many renal conditions with high blood pressure, eclampsia and uremia, chronic parenchymatous nephritis, in advanced anhydremia, in pernicious vomiting, in exophthalmic goiter, in osteo-arthritis, in threatened hemiplegia and in certain cases of syphilis, when the sedimentation time is markedly reduced and blood pressure is high.

3014 Hennepin Ave.

SOCIAL ASPECTS OF ORTHOPEDICS

Because of the humanitarian spirit which has developed during the twentieth century, orthopedics has extended its social task by striving for the eradication of crippleddom. Through the great help of charitable lay people, a wide social scheme of prevention, location, treatment, after-care, education, vocational training and placement service has developed, the beneficent influence of which is felt throughout the world. In this service wealth, science, technical skill and self-sacrifice have joined hands. And in the annals of mankind it may be noted with golden letters that to the English-speaking nations the honor is due to having given most in voluntary aid and charitable work.—DR. M. JANSEN, of Leiden, Holland, in Surg. Gynec. & Obst., Feb., 1932.

Acute disease is an act of God; of chronic disease the patient himself is the author.—THOMAS SYDENHAM (1624-1689).

The Electrical Factor in Medicine

By O. B. Simon, M. D., Batavia, Ill.

NEAR the close of the 18th century Galvani, professor of anatomy at the University of Bologna, noticed by accident that when frogs were hung by copper skewers and pressed against the iron rail, contractions of the frog's muscles resulted. Going a step further, in the year 1800 Volta invented a new source of electricity on this principle, by constructing a cell composed of plates or discs of copper and zinc, separated by a wafer of cloth moistened with acidulated water.

Again, over a century ago a botanist, Robert Brown, discovered tiny particles in the fluids of plants and animals, which possessed a continuous, dancing, spinning, oscillatory motion. These particles came to be known as "hemiconia" or "blood dust" and are now known as colloidal particles or chylomicrons. They carry electric charges which are affected by both bacterial and chemical action. Around this discovery has been built the comparatively new science of colloid chemistry.

It is strange that two such basic discoveries, each more than 100 years old, should have failed to find practical application in the healing art until comparatively recently.

The Human Body an Electric Cell

Now, as indicated by the early experiments of Galvani and Volta, we can apply the principle of the electric cell to the human body by applying to it two dissimilar metals, or electrodes, which are connected to a very sensitive meter. Since all the tissue fluids and the blood contain electrolytes, the circuit and electric cell are thus complete, and the current-generating ability of the body is then readily measurable. The difference between such an electric cell and the ordinary storage battery is that the currents generated by the body are very minute in comparison.

It has been found, with such an arrangement, that the amount of current generated by the human body will register over a definite range, and that persons in good health will show a fairly constant measurement, while those in ill-health will register either above or below that amount. A precision instrument for making these measurements has been designed by F. C. Ellis, an electrical engineer of Chicago. It is called a "micro-dynamometer." The readings on this instrument register upon the scale of a very sensitive, reflecting galvanometer which is connected through wires to a patient, by contact with copper and zinc electrodes. Readings are made almost instantaneously. The technic of its use is very simple.

I have used one of these instruments in my practice for the past six months, and it has

proved itself to be both interesting and useful. In general, I have found the instrument useful as a new clinical factor in the routine examination of patients, and in the diagnosis and determination of the progress of disease conditions. I utilize the measurements by the micro-dynamometer to assist in forming the clinical picture, as a new factor in diagnosis, together with the history, symptoms and physical examination. I consider it another valuable, objective finding to supplement the usual tests for pulse rate, temperature elevations, blood pressure, blood counts, hemoglobin estimation, blood chemistry, urine analysis, etc.

Vitality Index

In my experience to date with the micro-dynamometer, I have found that young people, who have always been well, will register about 50,000 divisions on the calibrated scale of the instrument. Persons apparently well, but having had illnesses at some time in their lives, will show a constant or optimum reading of somewhere between 30,000 and 50,000 divisions; and if they become sick their readings will change to a lower or a higher figure than their optimum. A chronic, debilitating condition, such as cancer, asthma or tuberculosis, will lower the readings. An acute condition, such as tonsillitis, cystitis and so forth, will show figures above the individual's optimum reading. Two different ailments can give the same readings and, conversely, the same ailment in two persons can give different readings. The readings measure the degree of severity of the ailment. This is called the "vitality index" by Ellis.

I have found that the vitality test on the micro-dynamometer is influenced by treatment, whether by drugs, physical therapy or electrotherapy. If the treatment, being employed is ineffective or becomes ineffective, it is reflected by the vitality index and a change of treatment is indicated. This test can be made at as frequent intervals as desired, as it requires but a few seconds to make the measurements and a very small amount of inconvenience on the part of either patient or physician. The term "vitality test" or "index" seems to be well chosen, as it is apparently a measure or index of an individual's vitality.

Polarity

Another test made by the micro-dynamometer, with an accessory instrument called a "Polarimeter," is for the electrical polarity of the body. On this measurement it is found that the person may be either positive, negative or neutral, and that he may show a different polarity at different times. It appears that

geographic location, barometric pressure and other climatic conditions markedly influence this factor. According to reports on the use of the micro-dynamometer in other parts of the country, it has been found that the majority of patients in one locality may be predominately positive; whereas, in another part of the country, they may be mostly negative.

The polarity of a patient must be determined before any electrical applications, because I have found that practically any such treatment will have an immediate effect upon this factor, either in the degree of displacement from neutral or in actual change in the sign of the polarity. This is also comparable to the electric cell, as it is a well known fact that a battery must be connected properly or it will not function as to charge and discharge. While the exact reason for the difference in polarity shown in individuals is not clear, the factor is employed at present in guiding the electric treatments, which the micro-dynamometer also gives and which result in clinical improvements, accompanied by definite movements of the vitality index toward the patient's normal or optimum, and of the polarity index toward the neutral, which is normal.

The current generator is included in the micro-dynamometer, and yields currents of minute intensity (microamperes), which are apparently acceptable to the human organism. This generator is also used in the measurement of skin resistance.

Localizing Technic

Up to this point I have been discussing the measurements of the patient as a whole. The instrument is equipped also with two small electrodes, one of copper and one of zinc. The copper is attached stationarily to the patient's forehead, and the zinc electrode is moved over the body surfaces as a finder or localizer, to locate diseased parts. A reading is first taken over a healthy part, as an arm, and then tests are made over the remainder of the body, considering only the readings that are higher than the first one. The localizing technic is of much value in finding foci of infection, such as infected sinuses and lesions of the chest or abdomen.

Ellis explains this phenomenon by attributing it to changes in the condition of tissues adjacent to lesions which increase the electrolytes at those points and so increase the currents generated by the contact of the exploring electrode. If there is heart disease with decompensated circulation causing passive congestion of the lungs and abdominal viscera, there will be higher readings when the localizer is contacted with the skin over any of the congested organs. Of course this technic is still in its infancy and needs much experimentation further to develop complete interpretations and proper evaluations; but the possibilities look very promising to me.

The reflex areas and nerve centers give increased readings when there is trouble in some distant region to which they may be related. This is a more or less unexplored field which should be investigated and has, apparently, been completely neglected by science on account of not having a suitable instrument for the purpose. I believe that the micro-dynamometer will prove a valuable aid to research in this interesting field.

Relation to McDonagh's Work

At the outset I mentioned the discovery of the brownian motion and colloidal particles. It was apparently the researches of J. E. R. McDonagh which enabled Ellis to get the concept of disease which led to the development of the micro-dynamometer. From his study of McDonagh's, "Nature of Disease," which is based essentially upon the colloids of the human body, he was able to develop a theory as to the electrical condition of the body; but, not being a physician, he overlooked certain points in trying to make his theory combine with the McDonagh theory.

A New Measurement

As a matter of fact, it seems that the greatest bar to the evaluation of anything new is the proneness, on the part of the inventor or others, to feel that it must coincide with some previous standard. This is futile. A thing which is new cannot, at the same time, be old. The only way to measure temperature is with a thermometer; the only way to measure blood pressure is with a sphygmomanometer; etc., and these instruments, being comparatively satisfactory for the purpose at hand, it is not necessary that any new device be developed to do the same thing, even if it were possible. So it is that the Ellis micro-dynamometer makes distinctly new measurements upon the human body. As he explains, it measures the whole living organism instead of parts thereof, as it makes its measurements electrically instead of chemically or physically. For example, according to McDonagh both sleep and insomnia are hydration processes; while, electrically, sleep lowers the micro-dynamometer readings but insomnia raises them, and the latter, according to Ellis, should be a dehydration process.

I feel that the measurement of the electrical condition of the body is a very valuable, dynamic, diagnostic aid, but that no effort should be made to make it correspond to any other measurements—certainly not with such a complicated and difficult subject as McDonagh's "Nature of Disease." The McDonagh work is highly specialized and results are based upon a very difficult examination of the blood after it is removed from the body; whereas the micro-dynamometer measures the sum total of the condition of all the tissue fluids and blood of the body as a whole.

Another interesting test made with the

micro-dynamometer is called the Oxidation Index, but, I believe, to be more properly designated as a Reserve Vitality Index. It registers the increase in the vitality index reading which takes place under forced respiration. With very ill persons this reading is low (even zero); whereas persons who are strong and have a rugged constitutional background will show a high reading. This is also analogous to the electric cell or storage battery: agitation of a good electrolyte solution increases the ionization and makes the current stronger; in a weak battery, agitation of the electrolyte does not increase the current.

It is now rather generally accepted, that every physiologic and pathologic change in the body is accompanied, not only by chemical but by electrical changes. These local and general changes will affect the micro-dynamometer readings. To illustrate: rest and sleep lower the readings, while activity raises them. This shows the need of having standard conditions under which to take the patient's measurements. I take the readings when my patients are in a partially rested state—neither immediately after sleep nor just after exhausting work. The factor of perspiration must be and is reduced to a practical constant by careful preparation of the skin contacts before each test.

Case Reports

The following cases illustrate some of the points mentioned:

Case No. 1: A man, 39 years of age, on April 26, 1933, had a vitality index of 68,000 before I operated on him for rectal fistula. He was discharged on May 27, feeling fine and with the rectal ailment completely healed. The vitality index on that date was 50,000.

Case No. 2: A girl, 7 years of age, suffering from acute bronchitis, on April 28, 1933, showed a vitality index of 63,000 and oxidation index of 5,000 plus. On May 16, when she was again in good health, her vitality test read 36,000 and her oxidation index 7,000 plus, which I would say was her optimum reading, inasmuch as she had had several attacks of pneumonia and bronchial asthma, and therefore would not have the same vitality index as another child who had never had severe illnesses.

Case No. 3: A man, age 38, having acute cholecystitis proved by cholecystography, on April 28, 1933, showed a vitality index of 78,000; oxidation index 0, as the disease was in an active phase and he was quite ill. On May 5 he was feeling much improved, clinically; his vitality index was 32,000 and oxidation 8,000 plus. Later he had another flare-up of the condition and his vitality index, on July 7, was 62,000 and the oxidation index 0. He was measured again on the micro-dynamometer August 4, when his vitality index was 28,000; oxidation index 0; his general condition was good and his gall-bladder ailment was quiescent.

Case No. 4: A man, age 56, July 5, 1933, was measured on the micro-dynamometer, just a few hours before being operated upon for appendicitis. His leukocyte count was 16,000; the pathologist's diagnosis was acute exacerbation of chronic, obliterative appendicitis; his vitality index was 35,000; oxidation index, zero. On July 27, when he was feeling well again and ready to go back to work, his vitality index had risen to 42,000 and the oxidation index to 5,000.

Case No. 5: A man, age 62, called me to treat him for sciatic rheumatism, April 15, 1933. Under the usual treatment his condition showed very little improvement. On April 25 I had him come to my office for examination on the micro-dynamometer, which showed his vitality index to be 29,000 and oxidation index 2,000 plus.

I explored his body with the localizing electrode. The area over the affected left sciatic nerve did not show any increased reading, as compared with the opposite, unaffected sciatic nerve; but a very high reading was obtained over the teeth, which, upon close examination, were found to be abscessed, suggesting that his sciatica was due to infected teeth. He had the worst teeth extracted and his rheumatic condition began to improve. Later he had all of his teeth extracted and his sciatica vanished entirely. On July 28 he was again tested on the micro-dynamometer, when the vitality index had advanced to 35,000 and the oxidation index was 2,000 plus.

Conclusion

No one can diagnose and treat disease from the micro-dynamometer tests alone, any more than from the use of the urine test or blood count or any other single diagnostic factor. Every factor is more or less essential and correlated, depending upon the disease condition.

The use of this instrument is still in the experimental stage, and it has not yet been completely evaluated. A constant measurement on the human body, which varies with the degree of illness, is temperature, which is noted by the rise and fall of a column of mercury in a vacuum. This measures the production of heat by the organism. The electrical measurement which the micro-dynamometer makes on the body is a factor which has received very little attention by the profession.

We should not be too backward in recognizing the utility in any promising, new method. This appears to be a method of measuring the amount of electricity the body produces when zinc and copper electrodes are applied to complete a circuit in which there is a sufficiently sensitive reflecting galvanometer, a properly balanced circuit and a properly calibrated scale. The principles involved are simple and readily understandable and should have been in use by the medical profession for at least a century.

5 E. Wilson St.

PHYSICAL THERAPY AND RADIOLOGY

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Solving the Problem of the "Chronics"

By Joseph E. G. Waddington, M. D., Detroit, Mich.

A LARGE majority of acute diseases and conditions are, obviously, self-limited and, therefore, quickly and satisfactorily amenable to comparatively simple treatment. Usually such conditions confine the patient to bed, where the acuteness of his disability and suffering dispose him to submit, faithfully and uncomplainingly, to the indicated course of treatment in all its personally restrictive details. Contrastingly, chronic diseases and conditions are not self-limited and, in a major portion of cases, neither confine the sufferer to bed nor to his home.

The "chronic," being an unfortunate result and survival of an acute condition, has visited many and diverse physicians and institutions; received much conflicting advice and absorbed a multitude of drugs; been assiduously rubbed and vigorously manipulated; receptively subjected himself to "absent" and other faith-healing courses of treatment; and, finally, with increasing disability but decreasing faith and financial resources, erratically wanders from one blind healer of the blind to each succeeding and alluring "cure" however bizarre and incredible. Occasionally, in sheer desperation, this peripatetic seeker after health returns to orthodox sources for help and consults some exceptionally recommended physician. He is then dishearteningly assured that nothing can be done for his particularly aggravated case that has not already been tried and found wanting; or else, if a reliable course of treatment be outlined, the now pessimistically and suspiciously inclined patient has neither the faith nor the means wherewith to pursue determinedly the required lengthy and rigid treatment indicated.

To treat the "chronics" successfully requires, preliminarily, years of wide and extended expe-

rience in general practice, both medical and surgical. Subsequently, a broad-minded, scientifically alert knowledge of the comparative merits and limitations of surgery; drug therapy; physical therapy, with all its comprehensive natural, electrical, mechanical, hydrotherapeutic, thermal, phototherapeutic and combined agencies; and psychology, and the acquirement of infinite patience, tact and sympathy, enable the physician of such matured and varied experience to treat the "chronics" with intelligent understanding. Inevitably, the lengthy attention and treatment involved; the multiplicity of diagnostic and curative appliances necessitated; and the ambulatory character of such practice, tend to office specialism. Such "chronic" practice demands the constant supervision of the physician himself, to encourage the discouraged unremittingly; to note every varying symptom, however slight; and to change or modify expertly a multiplicity of details which, only in coordinated entirety, eventually but emphatically mean renewed hope and health for the otherwise hopeless and incurable.

Each individual "chronic" needs abundant sympathy, tact and patience. He (which impersonally refers to both sexes) has suffered many things from many people, and only grudgingly accords his confidence until some mental and physical improvement reliably assures him that he has finally secured a physician whose promises mean skill and fulfillment. The "chronic" must first be impressed, however reluctantly, with confidence in his physician; and should then be impressed with confidence in himself to patiently attend undeviatingly to the business of regaining his health, by implicit obedience to all the behests of his medical attendant. As with certain legal

undertakings, so with professional services for the "chronic," "time is one of the essentials of the contract." After an unreserved confession and unburdening of his woes; of his mistakes of omission and commission; of his fears and his hopes; of his mental and his physical ailments and conflicts, the "chronic" is to be searchingly examined from head to foot, neither omitting the upper nor the lower orifices, so generally and intimately involved in many chronic processes of disease.

Unlike acute conditions, chronic ailments often express themselves so ambiguously as to direct attention misleadingly from the essential to the non- or negligibly essential; and to localize too restrictively upon some one or other apparently important symptom, at the expense of a less obvious but more vital condition. Local manifestations may often be the ignored signals of a fundamental constitutional impairment, attention to which latter is prerequisite to logical treatment and relief of the former. Mind governs the body to an important extent, just as surely as the body often affects the mind. A mind free from economic worries, domestic infelicity and introversion and pessimistic repinings, is as rare as, if not rarer than, a physically fit body. The "chronic" invariably has a mind which needs intelligent and sympathetic ministrations, not to be unwisely obscured by the more apparent physical distress.

To regain health requires that the "chronic" first readjust himself to his own particular environment as healthfully as is scientifically and practically possible. Correctly adjusted diet; sufficient intake of fluids; conditioned air (proportional ration of temperature, humidity and air motion); purposeful, invigorating exercise; and an equable mind, are the foremost requirements to be adjusted to each individual "chronic's" needs and resources. Upon this firm foundation, the skilled physician may then confidently expect to restore, in more or less degree, his equally confident patient's mental and physical wellbeing.

To specialize in or devote special attention to "chronic" practice, the physician must necessarily be a well trained physical therapist. Only by the discriminating skill of such an experienced practitioner can the multiplicity of natural and physical therapy agencies be correctly evaluated and administered, conjointly with a precise appreciation of the drug therapy to be expertly selected for the successful care of those "chronics" amenable to office treatment. The tonic, constitutional influence of long-wave ultraviolet rays; the germicidal action of low-wave ultraviolet radiation; the deep thermal reaction of diathermy and infrared radiation; the convenient orificial ThermiX or heat applicators; the combined effect of radium and heat in the Q-ray or radioactive electric compress; the chemical and trophic effects of galvanism; the contractile stimulation of weakened muscles and sluggishly functioning organs by the sinusoidal and faradic currents; the profound sedation of static electricity for general nervous irritability and instability; the rhythmic, delicately controllable, manipulative traction of stiffened joints and muscles by the "Articulator"; the stimulative cleansing by colonic irrigation, in constipation and chronic intestinal weakness; the simple, respectively stimulant and sedative, local and general hydrotherapy measures, so easily and satisfactorily available within the home; the coagulating and hemostatically cutting currents, which so conveniently and brilliantly dispose of many minor, chronic surgical conditions in the office, all these and many other physical or natural therapy measures; judiciously selected drug medication; frequent and regular office attendance; unremitting supervising attention by the medical attendant; and the whole-hearted co-operation of the patient, will slowly but surely resolve the problem of innumerable "chronics" and "incurables."

110 Atkinson Avenue.

LAY MEDICINE

Lay medicine exists today, probably as never before, and is founded upon the excuse that the medical profession, through laxity on its part, has neglected to interest itself sufficiently in the semi-scientific phases of medicine, which are so necessary in promoting educational as well as public relief agencies, incidental to a well-balanced medical program. Of course this is no fault of medical practice, because these fields do not belong to the individual, but the burden of the blame rests upon the profession of medicine and has accrued to our discredit through short-sightedness on the part of medical organization.—DR. L. O. FRECH, of Decatur, Ill., in Illinois M. J., Sept., 1932.

NOTES AND ABSTRACTS

Role of Physical Therapy in Cancerous and Precancerous Dermatoses*

WITH about ten different physical agents at our disposal, there are thirty or more different precancerous and cancerous lesions which are treated by them. The method used depends on the character and location of the lesions.

PRECANCEROUS

1.—*Senile Keratoses*: Treat by electrodesiccation, then curet the desiccated tissue away and apply the current to the wound bed. Follow with x-ray therapy.

2.—*Seborrheic Keratoses*: Treat by electrodesiccation, electrolysis, actual cautery or carbon dioxide snow. If infiltration is present, curet the lesion and follow with electrodesiccation.

3.—*Kraurosis Vulvae*: Treat by partial or complete vulvectomy, followed by plastic work necessary for good genital drainage.

4.—*Moles*: Electrolysis of hairy, benign moles will usually destroy both the hair and the mole. For further treatment or for non-hairy moles, use carbon dioxide snow, trichloroacetic acid, or electrodesiccation. The bluish-black or slate-black moles should be left alone, if not subject to constant irritation and if they do not show signs of growth. If malignant change is evident, excise radically with the endotherm knife. One day later, apply radium to the site of the lesion, to the surrounding area and to the glands that drain the area.

5.—*Radiodermatitis*: Remove the affected area surgically; destroy keratoses by electrocoagulation or other form of high-frequency current. Graft skin later, if areas are large.

6.—*Leukoplakia*: Destroy lesions with the actual cautery or by electrodesiccation.

7.—*Syphilis*: If gummas, interstitial glossitis, leukoplakia or scars from previous syphilitic ulcerations show evidence of malignancy, I resort to electrocautery or scalpel, followed by x-rays, radium or both.

8.—*Occupational Keratoderma*: Treat the discrete keratoses from such irritants as tar, pitch, arsenic, dust, oil and heat by electrodesiccation.

9.—*Lupus Vulgaris*: Destroy the discrete nodules by electrodesiccation or by the actual cautery or electrolysis. Dehydrate superficial nodules by applying a strong current to the surface for half a minute.

10.—*Tuberculosis Cutis; Papilloma of the Tongue*: Electrodesiccation is the treatment of choice.

11.—*Lupus Erythematosus*: Use carbon dioxide snow in both the discoid and disseminated varieties. In addition, I use gold solution intravenously and locally in the discoid varieties. Lotia alba alone may give favorable results in the disseminated type.

12.—*Arsenical Keratosis*: Treat discrete lesions by electrodesiccation.

13.—*Chronic Ulcers*: From varicosities, pelagra, fistulas and the like: Erythema doses of ultraviolet radiation ameliorate many cases. So do daily treatments with graduated doses of solar radiation or artificial ultraviolet rays.

14.—*Cicatrices*: Use erythema doses of x-rays or radium. Do not repeat until all evidence of reaction has disappeared. Mild cases may improve under frequent applications of galvanic currents. Massage is beneficial.

15.—*Cutaneous Horns*: Remove surgically and desiccate the base.

CANCEROUS

1.—*Basal Cell Epithelioma*: In general, use roentgen rays or radium. Radium has an advantage in such locations as the inner canthus of the eye and the alae of the nose. In using x-rays I usually precede radiation by electrocoagulation. I use from 3 to 4 skin units of the unfiltered rays, repeating this two weeks after all reaction has subsided. When the ear or nose is involved, the lesions are destroyed by electrocoagulation or excised with a high-frequency knife.

2.—*Prickle Cell Epithelioma*: Remove by electrocoagulation and follow with radium therapy, using intensive gamma rays. When the glands are involved, I resort to surgery in chosen cases. Radium may also be used satisfactorily. Tongue lesions are best treated by using one or two millicurie gold seeds, placing one seed to each cubic centimeter in and around the tumor area and from 4 to 6 such seeds in the base of the tongue, thus blocking the draining lymphatics. Penile epitheliomas respond well to x-rays and radium in early cases; when infiltration is deep, amputation of the organs by electrothermic methods is advisable. Treat epitheliomas of the vulva by excision with the high-frequency knife, followed by the implantation of radon seeds.

3.—*Basal-Squamous Cell Epithelioma*: Treat by wide excision, by electrothermic methods, followed by radiotherapy; or large doses of irradiation alone may be used successfully.

4.—*Transition-Cell Epidermoid Carcinoma*: Early radiotherapy is the treatment of choice.

*J.A.M.A., 100:385, Feb. 11, 1933.

Gold radon seeds may be implanted into the primary lesion. Apply high-voltage roentgen rays to the metastatic lymph nodes.

5.—*Melanocarcinoma*: Treatment by wide excision with the high-frequency knife, followed by electrocoagulation. Follow this procedure with irradiation.

6.—*Paget's Disease of the Nipple*: Treat by total mastectomy and follow by irradiation.

7.—*Bowen's Disease (Intraepidermal Carcinoma)*: Remove early with the high-frequency knife. Very resistant to radiotherapy, requiring large doses of roentgen rays and radium. Sharp erythema doses of grenz rays are successful in some cases.

8.—*Primary Sarcoma of the Skin*: (A) Treat the fibrosarcoma and the dermatofibrosarcoma by wide surgical excision; (B) treat the cellular types of the spindle-cell sarcoma with roentgen rays and radium; the fibrous type by surgical excision, preceded and followed by irradiation; (C) treat the giant-cell type with roentgen rays and radium; (D) treat neurogenic sarcomas by radical excision, followed by irradiation; (E) treat lymphosarcoma by radiotherapy. When the mass is unusually hard or the condition is recognized early, surgery and combined radiotherapy give the best results.

J. J. ELLER, M.D.

New York City.

Look for THE LEISURE HOUR among the
advertising pages at the back.

Cold Water Therapy*

A GOOD reaction is a *sine qua non* in all cold water applications. Therefore, a rational hydrotherapeutic technic must, as far as cold water treatment is concerned, consist chiefly of means that tend to bring about such a reaction.

The patient's reactive capacity should be ascertained by wrapping around his forearm a cold, moist towel, on which are given brisk frictions for 10 to 15 seconds. If this produces good reaction, the patient will, as a rule, react favorably to water procedures involving a larger body area.

Certain pathologic conditions are apt to react more or less abnormally to cold water applications. Highly irritable, nervous individuals respond irregularly, reacting for the most part poorly, showing a tendency to vascular spasmodic contraction. At other times these types respond excessively, exhibiting vasomotor disturbances, with a tendency to dilation, as in hysteria and exophthalmic goiter. In diseases of the peripheral nerves the reaction

is often poor. The same is true of febrile infectious diseases, due to toxic changes of the vasomotor innervation. Similar insufficiency of reaction is noticed in nephritis, this condition having a tendency to spasm of the renal vessels, as also in exophthalmic goiter and in chronic alcohol and morphine intoxications, due to the vascular atony that usually accompanies these cases. Patients with cardiac insufficiency, arteriosclerosis, anemia and chlorosis also react poorly to cold water treatment. A correct technic will, however, usually bring about a sufficient reaction in even these cases.

Upon the termination of a cold water application, the patient should be thoroughly dried at once and be briskly rubbed on top of the enveloping sheet, not with it. After all cold water applications, it is necessary, not only to guard against the patient's getting chilled, but also against his becoming overheated.

J. B. NYLIN, M.D.

Philadelphia, Pa.

Profuse Nasal Hemorrhage Checked by Radium

A CASE of persistent and profuse nasal hemorrhage was cured by the use of radium, after other remedies had failed. Twenty-five (25) mg. of radium element, screened by 2 mm. of platinum, was inserted opposite the bleeding area in the nostril and allowed to remain there for 4 hours. The bleeding stopped. On subsequent occasions when hemorrhage recurred, the same treatment had the same effect and finally the hemorrhages ceased.—DR. J. C. SCAL, of New York, in *M.J. & Record*, Oct. 19, 1932.

Electric Treatment of Flat Foot*

THE faradic current treatment of flat foot, as carried out in the Royal Northern Hospital, London, is as follows:

The foot is placed in a water bath, but the toes are not quite covered. A pad electrode is placed below the heel and a second below the metatarsophalangeal joint. The electrodes having been connected, the current is surged until a contraction is obtained. This causes contraction of the *flexor brevis digitorum*, the strongest raiser of the longitudinal arch.

For the *tibialis posticus*, the pad electrode below the metatarsophalangeal joint is removed and a disc electrode is placed over the motor point of the muscle, the second pad electrode being still under the heel. *Flexor longus digitorum* and *flexor longus hallucis* are treated in the same way. The *abductor hallucis*

*Arch. Phys. Therap., X-Ray, Radium, May, 1932.

*Brit. J. Physic. Med., Sept., 1932.

cis is made to contract by the use of a disc electrode.

Each of the above muscles should be made to contract a dozen times on the first treatment—this may be gradually increased.

Faradic treatment should be followed by suitable methods of physical treatment, usually given three times a week.—C. F. ORR WHITE, M.D., London, Eng.

Protection in X-Ray Therapy

DISCUSSING the measures necessary for the protection of both operator and patient in x-ray therapy, Dr. W. Stenstrom, of Minneapolis, in *Radiology*, July, 1932, points out that the precautions necessary to protect the patient require primary attention. The screening must be so arranged that no portion of the body outside the field receives more than a small fraction of the dose; as an upper limit we may say 5 percent of the field dose.

If the rays coming from the arms of a glass tube are permitted to reach the skin unobstructed, while the radiation from the target is heavily filtered, they may be intense enough to cause considerable reaction. It is evident that the distance from target to the nearest portion of the exposed skin must be checked with greatest care, at least to within one centimeter. If the exposure should be given at eight inches target-skin distance, when figured for a ten-inch distance, the obtained skin dose would exceed the calculated dose by more than 50 percent.

It is at least as evident that the "wrong" filter may give rise to serious consequences. Many schemes have been devised to eliminate mistakes of this kind. The various filters have, for instance, been marked with different colored bands, which are in direct view of the operator during treatments. Each filter may, when in position, close the electric circuit of a corresponding colored light bulb, etc. Such arrangements are of great value. Perhaps the most satisfactory method is the use of a large ionization chamber immediately under the filter. This should then be connected to a galvanometer placed in front of the operator. The readings corresponding to the different filters differ greatly. If the operator writes down the reading during each treatment, a record is obtained which can later be used to check the filter, if that should be called for. If a treatment were calculated for a 1-millimeter copper filter, but was given without any filter at all, the dose at the skin would amount to at least ten times the calculated value.

Buying and Installing a Fluoroscope for General Practice

IN OUR experience in a rather large general practice among people of moderate means, the acquisition of an upright fluoroscope with dark room facilities, while attended with many unexpected details and while limited in its field of applicability, is thoroughly practicable and profitable to the general practitioner, and limitation of space available need not preclude the utilization of this most interesting diagnostic tool. The initial cost including installation and supplies is \$1,684.—DR. C. AUER, of New York City, in *New York St. J.M.*, Aug. 1932.

I couldn't be without CLINICAL MEDICINE AND SURGERY.—V. F. S., M.D., Indiana.

BOOKS

Krusen: Light Therapy

LIGHT THERAPY. By Frank Hammond Krusen, M.D., Director of the Department of Physical Medicine, Temple University School of Medicine, Philadelphia, with a foreword by John A. Kolmer, M.D., Dr. P.H., D.Sc., LL.D., Professor of Medicine, Temple University School of Medicine, New York: Paul B. Hoeber, Inc. 1933. Price, \$3.50.

This book will possess a different value depending upon the reader's previous acquaintance with the subject. For one who knows nothing about the therapeutic use of radiant energy from heated sources, the book contains considerable information; to one who has a speaking acquaintance with the subject it presents most of the familiar facts as to physics and lamps seen in previous works in English and in magazine articles and advertisements, as well as the familiar nomenclature. To the student of therapeutics, and especially of phototherapeutics, the book is a disappointment.

No original work is reported. The references seem, in many cases, to be made, not because of the author's standing as a savant and investigator, but because of availability. Some of the most important contributors to our knowledge, both in this country and abroad, are not mentioned or are merely alluded to; while others, who are authorities merely because they have "written a book," are frequently and copiously quoted.

This volume reads more like an amplified prospectus for the therapeutic lamp trade than a critical exposition of valuable information to guide the physician in his selection and application of phototherapeutic methods. If these criticisms seem harsh, the inquirer is referred to "Physiological Effects of Radiant Energy," by Henry Laurens, also just off the press, for a standard of comparison.

F. T. W.

STOMATOLOGY

OFFICIAL ORGAN OF THE
AMERICAN SOCIETY OF STOMATOLOGISTS

ASSOCIATE EDITOR

ALFRED J. ASGIS, ScB., M.A., D.D.S.

Pyorrhea: A Problem for Medicine and Dentistry

By J. P. Henahan, D.D.S., Cleveland, O.

Professor of Exodontia and Anesthesia, Western Reserve University School of Dentistry

WERE the question asked: Under what circumstances or conditions do the interests of the patient, physician and dentist converge closest to a common point? The answer would be: In the diagnosis, treatment and prevention of the condition known as pyorrhea.

Of this degenerative disease, usually the first of that type to attack particular tissues, two forms are recognized: The first is associated with nephritis, diabetes or other intrinsic forms of disease involving the kidney and spleen. It is a result of lowered resistance to the attacks of bacteria of the mouth, and is characterized by complete periodontal-membrane destruction and a free flow of pus without a noticeable calcareous deposit, the rapidity of destruction being in relation to the intensity of the organic disease. This form of pyorrhea is incurable.

The second form of pyorrhea appears as what is probably the most common disease prevalent among civilized people. It is characterized by the presence of deposits of serumal calculus below the gum margin, and is the direct result of irritation and inflammation of the gingival tissues. Acute and chronic stages of suppuration with degeneration, which involve all the investing tissues of the teeth, lead to condensing osteitis and alveolar atrophy.

As the alveolar process is destroyed, pockets, possibly as large as a tooth socket, are formed in the inter-dental spaces, and these become occupied by pathologic growths. Inasmuch as this disease progresses painlessly, the patient is often unaware of its existence until extensive damage has already occurred. In the meantime, the condition has constituted

a burden upon the resistance mechanism of the blood stream.

Consideration of these facts at once suggests the dependence of the patient upon the physician or dentist for an early diagnosis, not only for the preservation of the teeth, but also to control a menace to health.

The physician's responsibility regarding this disease rests upon a diagnosis of the condition, its relation to general disease and informing the patient of the necessity for proper dental service. The simplest proof of the metastatic effects of pyorrhea in producing disease in other parts can be found in the several forms of eruptions on the face in pyorrheic patients.

The dentist's responsibility lies in combating this form of disease: First, by eradication of all pathologic growths which act at the same time to further destroy alveolar tissues and pollute the blood stream; and, second, by resorting to such prophylactic measures as will remove the source of irritation and prevent or delay the further loss of teeth, when that objective is possible and practical.

This oral disease, aside from its potentialities as a focus of blood-stream infection, is responsible for the complete loss of far more teeth than is attributable to dental caries. Whole sets of teeth are involved, often without a sign of decay, and fall out one after another, due to destruction of the bony process which supported them. In some cases, however, the tooth, although in an extreme condition, is prevented from falling out and may even be difficult to extract, due to condensing osteitis which hardens the remaining process. The condition, even before the teeth fall out, leaves the patient without proper organs for

mastication and, as a consequence, in danger of gastric disturbances and impaired metabolism.

In the absence of specific remedies, what is to be done about it? The answer is that medicine and dentistry must cooperate in the development of a routine course of procedure for the abatement of this disease and its causes. The campaign for oral cleanliness conducted by dentistry is vastly inadequate.

From the standpoint of the physician, there is no other area of the human organism which so frequently breaks down and creates a menace to the general health, as does the alveolar process in the interdental spaces.

The same amount of pathologic tissue as often occupies these spaces, if existing elsewhere, would cause the development of very positive symptoms, which would force the physician to dictate immediate removal. On the other hand, this condition, in the past, has been habitually passed over because of the lack of discomfort and of some understanding that the oral region possesses unusual and peculiar resistance powers not found elsewhere.

The Dento-Alveolar Joint

This leads us to a consideration of the dento-alveolar joint and the tissues entering into its formation. This union can be regarded as probably the most vulnerable anatomic formation in the entire body. Placed, as it is, inside the mouth, an ideal incubator for bacteria, which are already present in vast numbers, its own peculiar weaknesses are magnified by constant exposure to the attack of these organisms.

While we must give this joint credit for peculiar powers of resistance to invading bacteria while its tissues remain normal, there is much clinical and experimental evidence that it immediately becomes a port of entry for infection when it is involved by injury or disease.

In the normal patient with a clean, healthy mouth, the gingival tissue will be observed to be of a firm consistency and pinkish-white in color. It firmly encompasses the cervix of each tooth and forms into a wedge shape in the interproximal space. As long as the gingiva retains this firmness, it protects the deep parts of the dental joint from invasion by gross foreign substances. The slightest amount of inflammation relaxes the gums and leaves the deeper parts unprotected. It is at this stage that pyorrhea begins.

Experimenters and clinicians have shown that, even in the healthy condition, this union shows peculiarities which single it out as a vulnerable point. Dye stuffs placed in the gingivo-dental crevice soon find their way along the peridental membrane to the tooth apex. A stray toothbrush bristle will be carried into the dental crevice and find its way

gradually deeper, causing destruction and suppuration until removed. Silken ligatures or small rubber bands, sometimes overlooked by the dentist, will rather quickly cause loosening of the entire tooth, through a tendency to crawl toward the apex along the dento-alveolar crevice.

It is possible that the slight normal motion of the tooth in its socket is a contributing factor in this peculiarity of the dento-alveolar joint in receiving rather than repelling foreign substances, but regardless of the reasons, it is probable that microorganisms travel the same course and are received in the same manner.

When the foregoing facts are considered, we find the question suggested: What importance shall the physician attribute to disorders of the gingival and alveolar tissues in the scheme of diagnosis and prognosis of general as well as some forms of local disease?

One certainty is that, in view of the remarkable progress of research in so many other branches of medical science, it must be regarded as illogical to continue to dismiss consideration of this subject as a problem for another profession to solve. It should, of course, be taken up jointly, if possible, by both professions, each relying on the other for what help can be given.

Research can begin with the background that primitive man and savage people have been found to be remarkably free from pyorrhea. Alveolar destruction was present only as a result of tooth-form destruction, due to attrition resulting from the grinding effects of coarse foods through the years. The loss of contact points permitted food debris to pack into the interdental spaces to form alveolar pockets, which added their effects to other conditions attendant upon senile disintegration.

The foods of civilized peoples, therefore, must be regarded as lacking in those features which automatically afforded exercise and cleanliness to the gingival tissues and, on the other hand, added features which tended to create oral pollution and an inciting cause for gingival irritation.

Modern food stuffs, therefore, must be regarded as far more destructive to teeth than the primitive foods of lower people, but in an indirect manner. A practical problem for science would be to find a means to overcome this deficiency.

Cleanliness is the only remedy known today to combat the development of this disease, and until science liberates secrets which, perhaps through chemico or physiologic processes, will eliminate the cause of pyorrhea, this remedy alone must be relied upon.

Medicine and dentistry must realize that in pyorrhea there exists a major menace to health, and cooperate enthusiastically for its

control. Broadcasting the doctrine of oral hygiene for preservation of teeth and health and routine examination of the mouth of all patients is the practical procedure.

The toothbrush, notwithstanding deficiencies, must still be regarded as the chief instrument, while dentrifices and mouth lotions occupy a secondary position. The use of the toothbrush should be encouraged from early childhood, with instruction in its proper use, especially in massaging the gum tissues. Rinsing the mouth alone is insufficient, as the

much of the secretions coats the tissues and is not soluble in water.

Strong antiseptics, however, are not indicated for use in the mouth, but stimulating preparations help to increase momentarily the flow of the mucous glands, and assist in cleansing the surfaces. Deodorants are necessary under certain conditions, especially in the process for removal of detritus of odor-producing food, such as caseous products. A well prepared tooth paste or mouth lotion is sufficient for this purpose.

1021 Rose Bldg.

NOTES AND ABSTRACTS

Changing Trend in Dentistry*

AUTHORITATIVE self-criticism, as well as publicity in the lay press, is limiting surgery. Less surgical interference may be advisable.

Dentistry also has become dissatisfied with surgery and we are on the eve of a complete revolution which will eventually result in nothing less than the establishing of the "Dental Physician," because dentistry must move forward upon the times of prevention and general as well as local treatment.

Routine surgery will have to continue, but it must be combined with general bodily treatment. Even though the dentists of the future may be able to treat successfully the bodily conditions which predispose to both caries and pyorrhea, the ravages wrought by these diseases prior to treatment must be repaired by dental surgery.

This change is bound to come and it means nothing less than that the licentiate in dental surgery will have to undergo a complete medical training and probably take a medical diploma in addition to a dental diploma.

Diabetes and the Dentist

REFER any suspected diabetic patient to a physician for treatment before any dental surgical work is undertaken. Local anesthesia is no doubt the choice of anesthetic to use in dental surgery on diabetics, as general anesthetics have a tendency to increase acidosis in the diabetic, which may result in coma.—Dr. J. A. HOPKINS, of Rockford, Ill., in *Dent. Cosmos*, Apr., 1932.

*British J. Dent. Science & Prosthetics, through South African Dental Journ., March, 1933.

Oral Diagnosis and General Medicine

THE best that oral diagnosis has to offer in general medicine is qualified. It may be stated in any of the following forms: Infection is present in this mouth; infection may be present in this mouth; it is probably not present; there is every reason to believe that it is not present. In any case, the removal of all demonstrable infection will be advised; and in no case will the elimination of organs or structures be countenanced where there is every reason to believe that infection is not present.

The attitude of the dental consultant should be determined by the exigency of the situation, guided by the belief that, because the situation is desperate, treatment, though not logical, must be correspondingly radical. The temptation to venture opinions that are not justified is great; some dental consultants are more susceptible to such influences than others and more or less hypnotized by their altruistic enthusiasm, so that they issue promissory notes that are never fulfilled. The urgency and exigency of any given situation has to be determined, not by the dental consultant, but by the physician.—Dr. E. H. HARTON, of Chicago, in *New York St. J. Med.*, Nov. 1, 1932.

Dental Caries

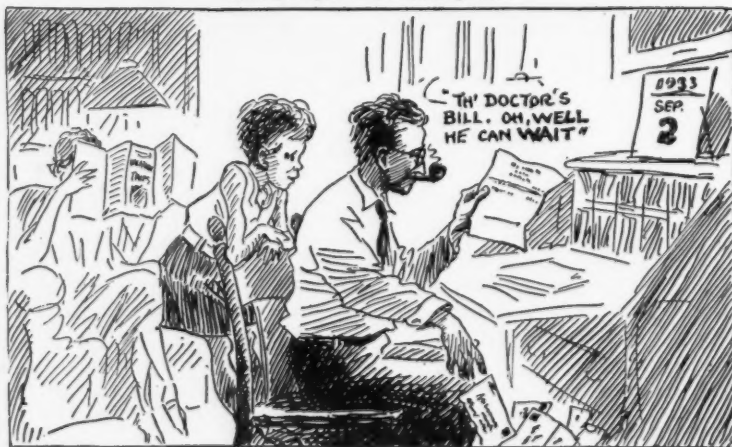
DENTAL caries is normal in civilized man. Nature causes the teeth of civilized man to decay because he does not need them to masticate the soft foods he eats.—Dr. C. HOOPER, of Coeur d'Alene, Idaho, in *North-west J. of Dentistry*, Jan., 1932.

A LIVING FOR THE DOCTOR

WAITING FOR THE DOCTOR AND MAKING THE DOCTOR WAIT



When it's important that the baby lives.



When it's unimportant whether the doctor lives.

Courtesy, Chicago Tribune

A Striking Cartoon

THERE is probably no cartoonist now living (if there ever was one) whose work has had a profounder influence upon the thinking of the American people than that of John T. McCutcheon, and in the cartoon here reproduced, which appeared recently in the *Chicago*

Tribune, he has struck a note which needs to be sounded in the minds and hearts of the people who have come to feel that the physician is the last man who needs to be paid for his services.

Feeling that many of our readers will want

to frame or otherwise mount this powerful reminder and display it on the walls of their reception rooms, where it can tell its story to those who need it, arrangements have been made whereby any physician who desires a

copy, 8 by 10 inches in size and suitable for framing, can procure it by sending six cents in stamps to the Business Manager, Chicago Tribune, Tribune Square, Chicago, Ill.

G. B. L.

The Age of Nihilism in the Teaching of Therapeutics in Medical Schools*

By Oliver T. Osborne, M.D., F.A.C.P., New Haven, Connecticut

Professor of Therapeutics, Emeritus, Yale University

I HAVE always urged that "therapeutics" means the treatment of any disease condition, whether it be an appendectomy, a gall-bladder operation, a pelvic operation, a tooth extraction, tonsil extraction, glasses for eye-strain, some endocrine gland treatment, treatment for deficient vitamins, diets, transfusions, serums, vaccines, electricity, irradiation, massage, sunbaths, rest cures or digitalis. The whole subject of the amelioration or cure of disease or of abnormal conditions of any kind should be classed under the heading of Therapeutics.

In 1905 I published the following formula:

Etiology produces Physiologic balance is disturbed by The lesions are the result of The symptoms are indications of	}	The Disease: Treatment to	{	Stop the etiology Help the physiologic balance Remove the lesions Ameliorate the symptoms
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Symptoms

It is only the consultant who can neglect the treatment of the symptoms. The physician in charge must modify or cure the symptoms, as well as do whatever is necessary to combat the disease that is present. The patient will not tolerate troublesome symptoms, and if his physician does not attend to them, he will find someone who will and who, many times, is a member of one of the many sects of practitioners who do not belong to the regular schools.

The disagreeable symptoms which a patient has should be treated before the diagnosis is made, after the diagnosis is made and when a diagnosis cannot be made, and these symptoms can generally be cured, modified, or at least ameliorated, by the skilled use of proper drugs. The knowledge of how to use valuable drugs, except in a few instances, is not taught in the medical schools at the present time.

Endocrines

Another most serious defect in medical school teaching, is the absence of detailed instruction in the physiologic and pathologic activities of the endocrine glands. There may be

demonstrations in their physiologic and biologic laboratories of the signs and symptoms caused by total ablation of one or more glands, but they have no way of demonstrating all the troubles that may be caused by minor insufficiencies of these glands. Hospitals and dispensaries can teach clinically only gross endocrine defects, such as myxedema, cretinism, acromegaly, diabetes, Addison's disease, rarely Mongolian idiosyncrasy or one of the infrequent types of adiposis or of some endocrine gland tumor.

I have long taught that every endocrine gland of the body can oversecrete and undersecrete in any degree. For instance, symptoms may be caused all the way from toxic goiter on the one hand to myxedema on the other, and all such symptoms can generally be corrected when the diagnosis of the cause is made. Not only may every gland hyper- and hypo-secrete, but each component part of each gland may do the same, and all cause symptoms. We are just recognizing hyperinsulinism. Gigantism is a condition that may later become acromegaly. There may be all types of precocious children, and all types of morons, and all should be studied from the standpoint of the endocrines.

Many years ago, when vitamins were first being discovered and described, I told Professor Lafayette B. Mendel, of Yale, that I thought these vitamins were probably activators of one or more endocrine glands. Lately, he has told me that he thinks I may be right.

Mouth Infections

A number of years ago I stated that the greatest menace to civilized mankind was mouth infection. I reiterate it today. Diseased teeth, diseased tonsils and infected sinuses and cavities in various parts of the head represent the greatest primary cause of disease of civilized peoples. It is not necessary to go into detail, but perhaps I may remind you that Charles Mayo has stated that seventy-five percent of all disease conditions proceed from the mouth. It is not necessary to state that other parts of the body may show focal infection, nor to show that many of these dis-

*Read at the Annual Meeting of the American Therapeutic Society, at Milwaukee, Wis., June 9, 1933.

tant focal infections proceed primarily from the mouth.

I believe that the majority of the blood diseases proceed from mouth infection, and the bone marrow is often seriously injured. Whatever the secondary symptoms are, I believe that pernicious anemia is due to mouth infection that interferes with liver activity as well as stomach acidity, and injures the blood-forming organs. The wonderful Boston discovery that liver extract is valuable in this disease, foolishly created a belief that iron was not needed, and from the beginning of the administration of extract of liver I urged that iron should always be given also. Most liver extracts contain iron, and latterly also a little copper; not that the administration of copper is necessary for the ordinary human patient, but because copper was found in the laboratories to hasten the replenishment of the blood in animals that had been exsanguinated. Also, some of these laboratory experimenters made the foolish statement, after bleeding an animal, that iron did not help it replenish its blood. Of course not! Such animals were suffering from hemorrhage, not from anemia.

Hodgkin's disease, in my opinion, is not an entity but a syndrome, and proceeds from some particular pathologic bacterium, probably generally located in the mouth, as the glands of the neck are generally the primary ones to become involved. I think the leukemias are probably of the same origin.

A diminished number of polymorphonuclear cells is now recognized as dangerous, and "agranulocytosis" is doubtless another infection that perhaps can proceed from the mouth. Probably if the blood were more studied during and after each acute infection, such as typhoid fever, we might find invariably a reduced number of polymorphonuclear cells, showing that the bone marrow had been damaged in its ability to produce these cells.

Knowledge of Drugs

With the larger and larger development of pharmacologic laboratories, it was thought that teachers of therapeutics were unnecessary and that the treatment of a disease could be outlined by professors and instructors in general medicine. This can not be well done. Both surgeons and professors of medicine have but a very meager knowledge of the practical action of drugs. They give analgesics and these stop pain, but they know little about other medicinal treatments, unless it is injections of arsenic and iron. Luminal is a great favorite, also preparations hiding some form of barbitol or aspirin. The same old purgatives are still used in hospitals, largely the compound cathartic pill and Epsom salts. Morphine is almost invariably given in too-large doses; small doses are not even recognized. Digitalization is thoroughly taught, and, for-

tunately, by a few men thoroughly condemned, except in fibrillation cases.

The pharmacologic laboratories can teach only a few of the strong drugs, given in toxic or semi-toxic doses for animal demonstrations. They can never demonstrate the action of small doses of many drugs that are, and should be, utilized in general practice.

Rationalism in medicinal treatment should be adhered to, *rational* treatment meaning giving the drug the symptoms of which can be demonstrated in the laboratory. However, many, in fact very many, useful drugs, whose action can not be demonstrated in the laboratory, must be used *empirically*; that is, from general knowledge of their long use and their beneficial action in certain disease conditions. And this is true of both internal and external medication.

Prescription writing and the minor materia medica truths are rarely now taught in medical schools. The student graduate, knowing nothing of prescription writing, orders the proprietary, readymade preparations. He does not know how to fit, by a prescription, his treatment to the individual patient. In order to treat his patient he may be compelled to order several proprietary medicines, thus causing expense to the patient.

This is the ampule and the vaccine age. Too many vaccines are given and, in the large majority of cases, subcutaneous medication is entirely uncalled for and unnecessary. It is forgotten that the stomach and the upper alimentary canal can absorb most drugs, if properly administered, without any discomfort whatever, else how do they absorb the vitamins, minerals and necessary proteins and starches that are taken with the food? It is practically never necessary to give from subcutaneously, for instance.

The Pharmacopœia

I have always advocated using only useful drugs, that is, drugs that have an activity after administration. The useless drugs and preparations of the Pharmacopœia have always been obnoxious to me. Most proprietary preparations, the ingredients of which are stated, when carefully studied, will be found to have only one or two ingredients that are of value; the rest is camouflage.

In order to have the young practitioner use or rely upon the United States Pharmacopœia, it must be a small publication and contain only valuable drugs and preparations. If it is full of detail and made into a large volume, the physician will not use it.

I recommended a great many deletions from the 1910 Pharmacopœia, a certain number of which were deleted. In the list offered for deletion from the 1930 Pharmacopœia, I find that twenty-six of them I had recommended for deletion in 1910, and twenty-eight more of them I recommended for deletion in 1920. In other words, it has taken all these years for

the deletion of these useless or second-rate drugs and preparations.

Before making specific recommendations for improvement in the medical school curriculum, I will state my heresy in believing that a three-year, instead of a four-year course in the medical schools for the degree of M.D. is sufficient. The three-year course, with short vacations, with less time spent in research laboratories, and with omission of the specialties, will furnish the same number of hours of actual study of the groundwork of medicine as are now given in the four-year course. In other words, these students should receive an M.D. degree in three years; then they may study one or more specialties if they see fit. However, it is better to study a specialty after some practical work has been done in internal medicine.

Recommendations

My recommendations are as follows:

1.—Each medical school should appoint an instructor in clinical endocrinology.

2.—There should be an instructor to give a short, practical course on simple materia medica, and to outline the best drugs and preparations of the United States Pharmacopeia. Also, this instructor should discuss the action of the useful drugs, overaction of such drugs, and their uses. It is impossible for the pharmacologic laboratories to demonstrate the action of drugs, except in large or poisonous doses. They can not show the action of small doses, and they can not demonstrate the action of many useful drugs.

3.—Brief instruction should be given on drug poisoning, the treatment of such poisoning, and on the symptoms and pathology of habit-forming drugs. The treatment of drug habits is successful only in special hospitals and sanatoriums.

4.—Instruction should be given in prescription writing. Prescriptions may be written in

English, if desired, with Latin titles not Latinized. Some years ago the Council on Medical Education of the A. M. A. appointed a Committee on Pharmacology, Toxicology and Therapeutics, and I quote the following from their report: "Incalculable harm has been done by the common and convenient habit of writing prescriptions, in hospital and dispensary practice, by numbers instead of the ingredients."

5.—Instruction should be given in necessary medication, in the treatment of symptoms and abnormal conditions, and when normal physiologic processes are upset. The opprobrium attached to "symptomatic treatment" has been long enough tolerated. Proper treatment of symptoms is an art and not a disgrace. I quote again from the report of that Subcommittee appointed by the Council on Medical Education, as follows: "The Committee recommends unanimously and most emphatically that a thorough, systematic and well planned didactic course in applied therapeutics or applied pharmacology be required."

6.—There should be short courses in the medical school curriculum on climate; exercise; athletics; massage; electrical applications, including diathermy; irradiation; the ultraviolet rays; the infrared rays; sun baths; hydrotherapy; serums; vaccines; transfusion; and occupational therapy.

Psychotherapy should be taught in a graduate course, as it should be emphasized that the study of the mental condition of a patient should take place, when needed, after pathologic, physiologic and endocrinologic causes have been found absent, or, if present, have been eliminated if possible. If we begin to study mentality and mental aberrations primarily, our success would be like placing a heavy, fireproof roof on a building, the foundation and superstructure of which were weak and decrepit.

1155 Forest Road.

NOTES AND ABSTRACTS

A Suggested Economic Solution*

PROPOSE a new agency in American affairs. It should be a body completely disassociated from government and from business and derive its ample resources from a capital endowment. Its nucleus should be a coöptative group of, say, five men, of whom three should in the first instance be designated by the ex-President or the ex-Presidents of the United States. The persons selected should not be, of

necessity, the professional luminaries of the business world nor the fluent laureates of a social bloc, but men of intelligence, integrity, courage and equipment, ready to burn all political and financial bridges behind them and to devote their lives to the public welfare. Its rôle should be an incessant alertness as to social affairs; a prompt inquiry into any creak in the economic mechanism; a fearless exposé of the mischief-making factors; a definite proposal of preventive intervention. It should utilize existing agencies of law and government and enlighten public opinion by systema-

**American Mercury*, Jan., 1933.

tized publicity. It should welcome fact and opinion from any quarter, and its statements should be individual rather than corporate.

Let us suppose the plan in working. Mr. Coolidge† and Mr. Hoover will have selected three men, who will have chosen two more—all to constitute the Institute of Affairs. From one of the existing welfare foundations or from one or more hard-headed multi-millionaires will have come an unconditioned endowment fund of \$100,000,000. By its own survey or by proposal from without, the Institute will have learned that some particular of the economic machine is, in presence or in working, a social injury; that public opinion is uninformed as to essentials; that administrative initiative is inert; or that legislative repair is delayed or incomplete in consequence of ignorance, timidity or resistance.

In each such case, the Institute will make prompt inquiry as to the need and manner of social intervention. The investigation will be less detailed than a scientific study; but it will be swifter. The report will not be a mere fact-finding exhibit, but will terminate in definite proposals in remedy, if the facts warrant; in disavowal, if they do not. Public enlightenment will be the objective—not only as to existing condition and practicable correction, but as to administrative halt, legislative inaction, corporate resistance. The devil may not have all the good tunes, and the Institute will use "public relations counsel" and systematized publicity. The campaign will not be of the front page order, but continuing and progressive.

As to its effectiveness, there can be no iron-clad guarantee; but a very considerable degree of probability attends. The competitive system, like any high-g geared mechanism, will continue to develop maladjustments. Capable of correction, they become grave if neglected or delayed. The customary mode of repair—in anything more than lip-service—is slack and imperfect. For this, an uninformed and unaroused public opinion is in the last resort responsible. And yet, democracy will rise no higher than its source. Unless rescue work is to be left to the little red schoolhouse, and to copy-book leadership out-of-the-wilderness, a new technic must enter. The experience of war-time propaganda has taught us the plasticity of popular opinion. Let that knowledge be used to meet the present need.

JACOB H. HOLLANDER, Ph.D.

Johns Hopkins University,
Baltimore, Md.

Look for THE LEISURE HOUR among the
advertising pages at the back.

†Written before his death.—Ed.

Prepayment Plans for Hospital Care*

THE vast investment in hospital properties has been made for the benefit of the public, but this benefit can be reaped only to the extent that the physical capital of hospitals serves and assists the knowledge and experience possessed by the medical profession—the real medical capital, which can not be monopolized for profit.

The physical capital of hospitals has been enormously increased and, sensing the financial pressure with which some hospitals are faced, certain commercial interests have recently developed mass-production schemes for hospital care, seeking to create a larger market to provide more funds with which to meet the hospital overhead costs.

In the various hospitalization membership schemes, promoters usually place limitations on the services to which members are entitled; they have likewise included, in several instances, a number of distinctly medical services which must be given by physicians without pay.

All such plans tend to lessen the control of county medical societies over medical practice and thus to decrease the effectiveness of the most important form of professional control of standards and ethics, while at the same time increasing the influence of lay commercial interests.

The moment the sphere of commercial competition is permitted to invade the organization, direction and marketing of medical services, experience shows that deterioration in ethics and service inevitably follows. Most of the current schemes for group hospitalization constitute a violation of the well established and time-honored principles of professional conduct and the practice of medicine. They have selected that portion of medical care which is easiest to sell and are endeavoring to create a mass-production market from which a considerable profit will accrue to the promoters.

Anything that separates the mental capital from the working tools and institutions of the profession is sure to prove destructive to the medical profession and injurious to the public.

R. G. LELAND, M.D.

Chicago, Ill.

CLINICAL MEDICINE AND SURGERY is the best journal I have ever taken and I thoroughly enjoy reading it. It has so many good articles of interest to a general practitioner, that no other one has.—H. A. C., M.D., Ohio.

*J.A.M.A., Mar. 25, 1933.

THE SEMINAR

(NOTE: Our readers are cordially invited to submit fully worked up problems to the Seminar and to take part in the discussion of any or all problems submitted.

Discussions should reach this office not later than the 1st of the month following the appearance of the problem.

Address all communications intended for this department to The Seminar, care CLINICAL MEDICINE AND SURGERY, North Chicago, Ill.)

Problem No. 8. (Surgical)

Presented by Dr. F. D. LaRochelle, Springfield, Mass.

(See CLIN. MED. & SURG., Aug., 1933, p. 426)

RECAPITULATION: A man of 35 years had a painless mass on his forehead (Fig. 1), which seemed to have developed following an injury in childhood. His general health had always been excellent.

The mass was hard and fixed to the skin and underlying tissues. Aspiration was negative and a roentgenogram showed erosion of the underlying bone; but the tumor did not spring from the bone.

Requirement: Suggest diagnosis and treatment.

Discussion by Dr. F. F. Schwartz, Fairport Harbor, Ohio

A DECISION as to the malignancy of this tumor would be easier to make if the history were more complete. We should be told about the rate of growth, the condition of the neighboring lymphatic glands and the appearance on transillumination.

Lipoma is the most common tumor of the forehead and occiput, and that is the probable diagnosis here, though one must consider sebaceous cyst, dermoid (a remote possibility) and malignant neoplasm (also unlikely). An incision over the tumor will clear up the diagnosis at once or permit the taking of a specimen for biopsy.

The treatment is surgical removal, under a local anesthetic.

Discussion by Dr. J. A. Gatterer, New Albany, Ind.

IN MY opinion, this tumor is a *plexiform hemangioma*. This type is not, properly speaking, a neoplasm, but a pathologic alteration of the blood vessels and nerves.

The treatment is removal by a cosmetic operation.



Fig. 1

Discussion by Dr. E. C. Junger, Soldier, Ia.

THIS man is more of a curiosity than some that Ripley has used as exhibits. Moreover, he should teach a good lesson as to the necessity for early care of tumors and deformities.

This growth is probably a *fibrosarcoma*, and should be completely removed by the actual cautery as soon as is practicable. In fact, there ought to be some method of *compelling* these monstrosities to have their deformities attended to.

Solution by Dr. LaRochelle

UNDER local anesthesia, an incision was made down to the frontal bone on the left side of the tumor and the skin and mass were elevated from the frontal bone. The tumor, a *lipoma*, with enormously thickened overlying skin, was dissected out and the skin flap trimmed to fit the wound and sutured, with a small drain. In ten days the wound was healed and the cosmetic result is excellent (see Fig. 2). It is extraordinary that such a deformity should be encountered, in these days, in a public official.

Problem No. 10. (Medical)

Presented by Dr. Dietrich Klemptner, Chicago

A WHITE girl, 22 years old, started complaining of weakness, dizziness and shortness of breath three months before admission. She noticed red spots that would come and go, on her arms and legs. Her menstruation, instead of four to five days, lasted ten to twelve days and was more profuse than usual. In the past week there was bleeding from the nose and the gums.

She was losing her appetite and was experiencing nausea and vomiting at times. Her weight was stationary. The past and family history revealed nothing of importance. Search into her dietary habits yielded the interesting fact that her diet had been poorly balanced, consisting mainly of milk and potatoes. Bananas were the only fruit she had eaten.

Examination showed a well developed girl; pulse, 120; temperature, 98°F.; respirations, 18. Her skin and mucous membranes were very pale. There were numerous petechiae on both arms and legs. The gums were firm and covered by blood clots. The heart was not enlarged and showed a systolic murmur to the left of the sternum. The spleen not palpable; there was no adenopathy.



Fig. 2

Laboratory findings: Blood: Hemoglobin (Sahl), 5 Gm.; red cells, 1,950,000; white cells, 5,450; differential count, within normal limits; coagulation time (Wassermann tube), 14 to 15 minutes; bleeding time, 5 minutes; number of platelets, 160,000. The capillary (tourniquet) test was negative; so were the blood Wassermann reaction and a blood culture. The urine was negative for albumin, blood and sugar. X-ray plates of the chest and long bones showed no pathologic findings.

Requirements: Give diagnosis (with reasons), treatment and prognosis.

UMBILICAL HERNIA

Do not be in haste to operate on an umbilical hernia in an infant—put on a truss.

Unless the rupture be a very large one, the wearing of a truss for six months or a year will cure a baby's hernia.

Never apply a truss, the pad of which is likely to protrude into the abdomen through the ring—this will prevent rather than produce cure.

A pad is seldom needed, or a truss for that matter, for the umbilical hernia of infants—a strap of adhesive or a band of elastic "webbing" with a bit of gauze at the hernial orifice often cures the condition.—Bernays' "Golden Rules of Surgery."

CLINICAL NOTES and ABSTRACTS

Mathematics and Medicine

MATHEMATICS is, without any doubt, the most exact means of expression that humanity has today. It is his most rigid and relentless language. In it he has sought to express all the laws which govern the most primitive mechanics, as well as the most complicated cosmic architecture. Mathematics is man's most potent instrument, and his oldest.

At the dawn of human intelligence mankind had two choices in the matter of building a future civilization. The first was in the perfection of his own body, by searching for, formulating and expressing exact or approximately exact laws of the vital chemism and, in this way, establishing life on a firmer basis. The second, and more obvious, was searching the universe for its laws and reducing them to exact and rigid statements. The most important subsidiary activity was localizing the universal; i.e., building machines in miniature duplication of general universal laws.

The second of these choices was the one that man chose to follow. Primitive man was more interested in constructing a bow and arrow (primitive attempt at translating primeval mathematical physics to reality) than he was in trying to arrive at an exact understanding and mathematic expression of this understanding of the vital phenomena. The physical sciences are, therefore, the more primitive. Early man was more interested in building a canoe or a bridge than he was in understanding the working of his own organs. The universe was dissected aeons before the organism. This was, perhaps, a very natural thing, for man loves comfort more than he does security of existence.

Thus, a civilization that might have gone in either of two directions was developed along the less desirable one. Modern civilization has been built essentially on a basis of mechanical engineering instead of biologic engineering. Our achievements in stating the laws of cosmogeny are phenomenal; but our attempts to state vital phenomena in exact mathematical formulas are puny.

The sciences fall into two very broad classifications: the biologic and the physical.

Of the two, the physical sciences are characterized by having a mode of expressing their facts and observations in exact and invariable language, mathematics. Mathematic formulas represent tangible facts. The biologic sciences have been characterized by a lack of language whereby to state their fundamental facts. It is for this reason, among others, that medicine cannot be called an exact science, while physics can. Medicine is less bestrewn with mathematic expressions, not because it is inherently devoid of them, but because the mathematics of biology has not been developed in the way it should. It is disheartening to reflect that physiology, the study of vital dynamics, is beneath the dignity of physics, the study of the laws of inanimate forces and objects, as far as possessing a mathematical language goes.

Luxurious refinements have become more numerous and richer. Attempts at shortcuts to human experiences—means and methods of living life more fully and speedily, but not more surely and certainly; not more firmly—have become the principal activities fostered by a mathematically guided physical science. The excessive development of the physical sciences has put life on a weaker basis. Present-day mathematics, as the High Priest of the physical sciences, has been a veritable enemy of mankind. The horrors of modern warfare and of modern life in general have underlying them a purely mathematic basis. The automobile, the locomotive, firearms, direct outgrowths of applied mathematic physics, may have made human existence more convenient, but certainly not more certain.

Perhaps it is not too late to turn the tide in the right direction. Perhaps there is yet time for the birth of a more beneficent mathematics; for the administering of a reviving tonic to the biologic sciences. The alliance of mathematics with biology would lead to most fascinating and valuable results. There is a set of mathematic statements defining the movements of the heavenly bodies, but there are no mathematic formulas clarifying the interrelation of the endocrines and bodily development and wellbeing.

There have, however, been several attempts

in the right direction. Professor W. J. V. Osterhout, in his laboratory at Woods Hole, Mass., is one of the pioneers. He has been endeavoring to apply quantitative measurement to the processes of life—to find mathematic formulas that would show just how much a plant or an animal cell is alive or how near it is to the zero point, which we call death. One of the most gratifying books dealing with the new and more benevolent mathematics is his "Injury, Recovery and Death."

The vital process may be conveniently reduced to a statement: Life is the mathematically harmonious relation between the vital centers of an organism. Physiologic research has established what these vital centers are, but we have no mathematic formula which can give us a conception of the complicated interaction between these organs. A calculus of this would, in fact, reduce life to a series of mathematic formulas.

A step in the right direction has been taken by Ellice McDonald, who has reduced life to a chemical equilibrium:

$$K \frac{H_2CO_3 \times H \times S_o \times E_r}{BH CO_3 \times OH \times S_r \times E_s}$$

In this formula, K is the protein constant of protoplasm; $BHCO_3$ is the fixed alkali of univalent cations; H_2CO_3 is the fixed acid of bivalent and trivalent cations and all anions; OH represents free hydroxyl ions; while H represents free hydrogen ions; S_r represents the reduction part of the oxidation-reduction poise, in the sense of Maxfield Clark; S_o is the oxidation part of oxidation-reduction poise; E_s represents the sympathetic effect producing emotions; while E_r is the vagus effect producing emotions. In this formula, the equilibrium of life is determined by the protoplasmic constant K. In the upper bracket are the environmental influences producing changes.

McDonald has probably produced the most complete formula for the vital chemism. Perhaps the time is not far off when a mathematically minded biologist will endeavor to interpret it in the light of the rigid terms of mathematics.

EDWARD PODOLSKY, M.D.

Brooklyn, N. Y.

The Nature of Epilepsy*

EXPERIMENTAL and clinical studies of the relationship of epileptic seizures to variations in the water and mineral exchanges of the body showed that:

*Ann. Intern. Med., Oct., 1932.

1.—Production of a deficit in the body-water by any means tends to cause a temporary cessation of convulsions in severely epileptic children.

2.—Reestablishment of a positive water balance results in recurrence of seizures in such patients.

3.—Typical grand mal attacks can be induced, in a high percentage of the mildly epileptic patients, but not in non-epileptic patients, by giving water at the rate of from 2 to 5 cc. per kilogram of body weight per hour, while maintaining effective pituitary antidiuretics. This difference in response between non-epileptic and epileptic patients appears to be sufficiently specific to serve as a test in differential diagnosis in obscure cases.

4.—Dilution of the extracellular body fluids is considered to be essential to the induction of seizures under these conditions, because addition to the low-mineral diet of just sufficient sodium chloride to prevent dilution tends to prevent their occurrence.

5.—Mineral studies show that, during periods of diuresis and freedom from seizures, the excretion of sodium and chlorine greatly exceeds that of potassium.

6.—In one series of experiments it was found that the potassium balance was strongly negative during convulsive periods, when water was being stored. At the same time sodium showed a slightly positive balance.

7.—Since most of the potassium of the human body is held within the cells, this marked increase in potassium excretion, which manifested itself in the case of the severe epileptic from 2 to 36 hours before convulsions began to occur, indicates a "leakage" through the cell membrane. This phenomenon has not been found to occur in normal subjects under similar conditions.

8.—These and other data referred to are tentatively interpreted as favoring the view that the mechanism for controlling the semi-permeability of the brain-cell membranes is inherently defective in epilepsy.

I. McQUARRIE, M.D.

Minneapolis, Minn.

The Schilling Blood-Cell Count as an Aid in General Surgery*

THE principle of observing the immaturity of white cells by the shape of the nucleus was first brought forward by Arneth, in 1892. Because of the impracticability of Arneth's classification, it was never popularized until Schilling, in 1911, simplified it into what is now known as the Schilling differential blood count, or the Schilling hemogram.

I have recently applied Schilling's differen-

*Illinois' M. J., Aug., 1932.

tial count in a series of 5 illustrative surgical cases, in which routine counts were made twice daily. It is important to observe all parts of the differential count, not merely the rise and fall of the staff count alone. A variation from the normal sequence of a cellular reaction should put one on the alert for a complication. The monocytes and eosinophiles are extremely sensitive indicators of the stimulation and defense reactions going on. An abnormal variation appears 24 to 48 hours before symptoms are apparent in the clinical condition.

H. P. MILLER, M.D.

Rock Island, Ill.

Look for THE LEISURE HOUR among the
advertising pages at the back.

The Unstable Colon and Neurosis*

CONDITIONS described by the terms "spastic colitis," "intestinal neurosis," "nervous diarrhea," "constipation," "mucous colitis," etc., in recent years have been placed by some gastro-enterologists in the more suitably designated category of the "irritable" or "unstable" colon.

A study of 1,000 such patients reveals that 73 percent of these patients gave a history of the daily or frequent use of laxatives, enemas and colonic irrigations. In 62 percent there were found associated symptoms of neurogenic origin, varying from easy fatigability and vertigo to headaches, nervousness and depression.

The following deductions, which confirm clinical impressions, have been made from this study:

1.—There is a group of patients who have gastrointestinal symptoms due to a functional disorder in the colon, caused by specific irritation and not dependent on a centrally neurogenic cause. This irritation is usually due to the use of cathartics and enemas.

2.—There is another group of patients with the dysfunction of "unstable colon" who have associated neurogenic symptoms. Since the treatment of these two groups of patients has been the same, except for the nonspecific and casual psychotherapy consequent on the association of physician and patient, and since there is a definite percentage of patients in this second group who show clearcut improvement in their neurogenic symptoms, it is assumed that the condition of colonic dysfunction may precipitate, in a fatigued patient, symptoms of neurosis, and that when the normal physiologic condition is restored, the associated symptoms are relieved.

Finally, it is shown that there is a small

group of patients suffering from both neurosis and unstable colon, in whom the relief of the latter condition improves the general condition of the patient but does not affect the neurosis.

SARAH M. JORDAN, M.D.

Boston, Mass.

Superfetation

(A Case Report)

ON APRIL 3, 1933, I attended a case of abortion of an embryo at about the end of the sixth week of gestation. The fetus was about 1½ inches in length and was delivered intact, with the amniotic sac and placenta.

The following night I was called again to attend the same woman in another abortion, this time of a fetus of about 4½ months' gestation. Here I had difficulty in delivering the placenta and the hemorrhage was profuse. The mother, however, made a slow but uneventful recovery. Both fetuses were males.

Had this been a pregnancy with male twins, both would have been attached to one placenta and the smaller one would have had a marasmic appearance. But in this case both fetuses were entirely normal, for their stage of development, in color, form and size.

E. J. HAY, M.D.

Rogers, N. M.

Cases like this are decidedly rare and raise, again, the question of the possibility of superfetation.

We shall be glad to hear from any of our readers who have had similar experiences.
—Ed.

Value of Blood Sedimentation Test for the General Practitioner*

THE blood sedimentation test is one of the oldest, simplest and easiest clinical laboratory procedures. Its extreme simplicity puts it in the reach of the busy practitioner.

It is one of the most delicate tests for the detection of the destruction of tissue within the body and it varies directly with the amount of tissue destruction going on at the time of the test. The speed of settling in the first fifteen minutes gives immediate information when there is severe tissue destruction.

The test has found widespread use as an aid in diagnosis and repeated tests have aided greatly in controlling the treatment of many conditions. The extent to which it may be used as an aid in differential diagnosis is not yet determined.

The figures obtained from 148 presumably healthy male medical students warrant as normal, for males, not more than 2 percent for

*J.A.M.A., Dec. 31, 1932.

*Tri-State M. J., Dec., 1932.

a fifteen-minute reading and not over 10 percent for a one-hour reading. Between 10 and 15 percent would be abnormal; while above 15 percent is distinctly pathologic.

JAS. A. BRADLEY, M.D.

New Orleans, La.

Control of Eclampsia by Dehydration*

FOR the moderately eclamptic patient, fluid intake is limited to the amount of the previous day's urine output. The patient is fed well on a low-salt diet, avoiding soft and liquid foods, sweets and desserts. Dehydrate the patient moderately with small daily doses of a saturated solution of magnesium sulphate.

For the dangerously threatening pre-eclamptic patient, the fluid intake is kept below the urine output. Dehydrate immediately by: (1) magnesium sulphate solution, given orally until watery stools appear; and (2) 50 cc. intravenous injections of 50-percent dextrose, repeated in 4 to 6 hours if necessary.

For the actively convulsant patient, hypodermic injections of sodium luminal, 2 or 3 gr. (0.13 to 0.194 Gm.) are given immediately. Morphine sulphate is not given unless absolutely necessary, and then only after dextrose injections and spinal drainage. Inject 50 cc. of 50-percent dextrose as soon as possible. Drain the spinal fluid as completely as possible (45 to 100 cc.), preferably keeping the patient's head raised at an angle of 30°; otherwise perform venesection until the systolic pressure drops 30 to 50 points. Repeat dextrose in 3 to 4, spinal puncture in 4 to 6 hours, if the eclamptic flashes have not abated. Allow absolutely no fluids, except effective doses of magnesium sulphate by mouth or bowel, for 24 hours.

DRS. J. O. ARNOLD AND TEMPLE FAY.

Philadelphia, Pa.

Brain, Adrenals and Pituitary

AT THE meeting of the Chicago Medical Society, on April 26, 1933, two discussions, led by Drs. George W. Crile and J. B. Collip, were so interesting and important that I took notes of them and have ventured to present brief abstracts for the benefit of others.

THE BRAIN AND THE ADRENALS

By George W. Crile, M.D., F.A.C.S.,
Cleveland, O.

Civilized man suffers from a number of diseases which do not afflict the lower animals, savages, morons and the insane, because they

*Surg. Gynec. & Obst., Aug., 1932.

are the result of the phylogenetic development of the brain, the manipulating hand and the thyroid. Among these, Graves' disease and neurocirculatory asthenia are typical. Man works all day and worries all night, and some of his physical troubles are due to his emotional and mental activities.

The brain may initiate the expenditure of energy, but the level and speed at which it is expended are determined by the thyroid and the adrenals. Patients with a lesion of the spinal cord which cuts communications between the brain and the autonomic system are without emotion.

Thyroid hyperplasia is imposed on that gland from without, and the condition can be cured by severing the nerves to the adrenals, which stops the overcharge of energy to the thyroid.

Peptic ulcer, neurocirculatory asthenia, essential hypertension and many cases of paroxysmal tachycardia are diseases of high-strung individuals—teachers, executives, secretaries, Phi Beta Kappas—people with active brains, and can also be relieved by adrenal denervation. But this operation will not cure Buerger's disease (though it does help in Raynaud's disease), hysteria nor a psychosis; neither will it relieve high blood pressure associated with damage to the heart, blood vessels or kidneys.

This operation was first performed twenty years ago, and that patient has been in good health ever since. From that time, 228 patients have undergone the operation, four of whom have died. Relief is generally prompt; improvement is continuous and progressive and the final results are almost always satisfactory.

It is to be hoped that this surgical procedure will not be widely attempted by men who are not thoroughly familiar with its indications and technic. If this should happen, the results might be disastrous and a promising method of treatment might be thrown into disrepute.

THE ANTERIOR PITUITARY

By J. B. Collip, M.D., Toronto, Ont. Can.

At least five or six hormones, and possibly more, are produced by the anterior lobe of the pituitary gland. One stimulates growth; another, lactation; another, the adrenals. One is thyrotropic; another, gonadotropic; and still another, diabetogenic.

By injecting suitable hormones into animals, they can be made to grow very rapidly; hyperplasia of the thyroid or adrenals or diabetes can be brought on; lactation can be established; and the basal metabolic rate increased.

A hormone extracted from the placenta ("A.P.L.") behaves very much like the anterior pituitary sex hormone, but is not neces-

early identical with it. Its effects in animals are different if the hypophysis has been removed. In man, there are differences in the effects when administered before and after puberty.

There is no doubt of the activity of anterior pituitary extracts in all of the fields mentioned, but it is not yet certain that each effect is produced by a separate hormone.

JAMES H. HUTTON, M.D.

Chicago, Ill.

Nembutal in Mental Hospital Practice*

THE action of Nembutal alone, by the intravenous route, was tested on 50 mental patients, over 70 injections being given. The solution was made by dissolving 0.5 gm. of Nembutal in 10 cc. of sterile distilled water. Injection was made at the rate of 1 cc. per minute, being stopped as soon as the patient lost consciousness. The dose of Nembutal necessary to induce unconsciousness varied from 0.25 gm. to 0.5 gm. or from 5 cc. to 10 cc. of the solution. The usual amount was from 6 to 8 cc. in over two-thirds of the cases. Generally speaking, the dose varied from 5 to 6 cc. in maniacal and confused patients; 6 to 7 cc. in melancholics and katatonics; 7 to 8 cc. in paranoiac cases; and 8 to 9 cc. in schizophrenics.

The period of sleep varied according to the time of day at which the drug was administered, being longest in the evening. When given in the morning it varied from 2 to 4 hours; in the evening, it lasted for an average of 11 hours.

The first sign of the action of the drug was usually a vasomotor flushing, accompanied by muscular relaxation. As the injection proceeded, the speech became more and more slurred, and finally tailed away altogether. The picture presented by many patients resembled that of alcoholic intoxication. They were happy, garrulous and mildly confused, ultimately lapsing into unconsciousness. In noisy patients the change in the course of five minutes or so from pandemonium to complete quietude was most impressive when first witnessed. The variation in the mental reaction of the patients during the giving of the injection was interesting. Some became jovial and reminiscent, others wept and others exhibited complete apathy. Melancholics as a rule became genial and talkative. One katatonic perspired freely just after falling asleep. Generalized tremor occurred in one hebephrenic, and persisted till the onset of sleep. This proved to be peculiar to this patient, as on repeating the injection he responded in exactly the same way.

**J. Ment. Science*, Oct., 1932, p. 892.

No alteration in pulse rate occurred. In 15 patients, there was a fall in systolic blood pressure varying from 4 to 54 mm., being most marked in cases with high blood pressure. In 21 cases there was less than 1 percent variation in the carbon dioxide content of the blood following administration of the Nembutal and during the period of its action. Thus, its effect is not due either to the production of acidosis or alkalosis.

With correct administration, untoward effects from Nembutal are negligible. It is a safe drug when injected in accordance with the routine mentioned above. The patient should be under observation for the first hour, in the same way as a patient recovering from a general anesthetic.

Nembutal produces a sedative effect with a quickness and a certainty of action not possessed by the other drugs in the equipment of a mental hospital dispensary. In addition to its powerful hypnotic action, Nembutal exerts a calming effect on agitation (as in agitated melancholics), lasting for some days. It assists in the investigation and assessment of the mental state of inaccessible and reticent patients. It has produced a curative action in early psychotics. In cases of emergency (cut throat or fracture), the necessity for a general anesthetic may be obviated by its use.

DUNCAN MACMILLAN, M.D.

Nottingham, England.

Colopexy for Prolapse of the Rectum*

MY METHOD of fixation of the colon for remedying prolapse of the rectum follows:

A left rectus incision, extending from the pubes to the umbilicus, is made with the patient in a high Trendelenburg position. The small bowel is packed off, exposing the colon, which is pulled up taut and quickly tried in position, to determine the exact and relative location of the proposed fixation. The general location of the left ureter, mesial to the psoas major, should be borne in mind. The psoas minor, which is a tensor of the iliacus fascia and has some mobility, makes an excellent location for the fixation, the tendinous portion being used. The iliacus fascia is more commonly used, with no particular advantage other than that it is always present and accessible.

A 3- or 4-inch incision is made through the retroperitoneum and areolar tissue over the site chosen for fixation, the tendon or fascia being exposed. A No. 1, chromicized gut suture is first placed through the longitudinal band of the colon, a little below a point where

**J.A.M.A.*, July 30, 1932.

it is then to be inserted into the *psaos minor* or the fascia of the *iliacus*, and left untied. Four or five sutures are then placed about one-half inch apart, in relative positions. When the first or lower suture is tied, it pulls the colon up and in approximation to the exposed fascia; the other sutures are then tied successively. The lateral or outer edge of the peritoneum is sutured lightly over this fixation area to the colon, a fine needle with fine plain catgut being used, thereby covering all raw areas.

It has been found unnecessary to suture the mesial edge of the peritoneum to the intestine, since it is in apposition to it after the fixation sutures are tied. It has also been found unnecessary to denude the colon at the area to be fixed. The usual abdominal closure completes the operation.

E. G. MARTIN, M.D.

Detroit, Mich.

Insulin in Malnutrition*

THE use of insulin in non-diabetic primary and secondary malnutrition in children and adults is suitable for both private and hospital practice. The effect on the patient is to stimulate the appetite, bring about greater utilization of carbohydrates, correct possible dysfunction of the pancreas and stimulate the entire endocrine system. Insulin is a biologic product, unrestricted in its action to one system or organ in the body, and malnutrition from any cause is the primary indication for insulin, with best results to be expected in patients without evident organic disease. Patients with a good appetite appear to react most favorably to small doses. In patients with anorexia, larger doses seem to produce better results, in direct proportion to the degree of anorexia.

There are two acceptable methods of using insulin. The first, best adapted for ambulatory patients, is the injection of one dose daily before the noon meal, given about twenty minutes before eating to allow sufficient time for absorption. Begin with doses of five or ten units and increase to fifteen or twenty units, according to tolerance. The second method is to give two or more smaller doses each day. Ten units may be given before any two meals or before each meal, preferably twenty minutes before. Because of inconvenience to the patient, this method has not proved so satisfactory as one larger dose each day. In either procedure, the physician should initiate the treatment in order to ascertain the tolerance and optimal dosage for the individual patient, and then teach the patient to administer the insulin himself, emphasizing accurate dosage, sterilization of field and the importance of

varying the injection site, to avoid local fibrosis and atrophy of subcutaneous fat. In gaining weight, the sedentary patient reacts more satisfactorily than the one doing hard, manual labor. No deleterious effects have been noted, even when therapy was continued over long periods of time.

Three possible complications must be kept in mind: Hypoglycemia, allergy and heart disorders. Hypoglycemia first manifests itself about two hours after injection, by weakness, restlessness, perspiration, hunger, and perhaps vertigo and epigastric distress. Sugar should be carried for immediate ingestion on the appearance of such symptoms. In patients with allergy, insulin should be given with caution. If a wheal, general eruption, itching or gastrointestinal distress appears, it is usually about ten minutes after injection and can be relieved by calcium lactate orally. Epinephrin is rarely necessary. The source of insulin should be marked on the bottle; then, if beef insulin causes a reaction, pork insulin may be tolerated satisfactorily, and vice versa. Myocardial contraindications, as in angina pectoris and aortic insufficiency, will be found infrequently, although, to discover heart conditions, a routine examination should be made in all patients.

R. D. MERZ, M.D.

Detroit, Mich.

Metaphen, Intravenously in Septicemia*

THE following factors concerning septicemia and its treatment appear to deserve especial emphasis:

In the usual conception of septicemia, attention is focused on the organism in the circulating fluids of the body, to the exclusion of all other factors; while in reality, septicemia is a recognized clinical entity, of which the presence of invading organisms at some time in the blood stream is only one feature.

It is well to bear in mind the fact that septicemia is by no means of rare occurrence, and that the problem, therefore, requires the serious consideration of the medical profession.

It is important that cases of septicemia should be studied, both clinically and in co-operation with the laboratory.

Septic cases demand early diagnosis, isolation, and proper treatment.

It is my opinion that, at the present time, there is no bactericidal agent which can be safely introduced into the blood stream in quantities sufficient to sterilize it completely. However, we have found that Metaphen 1:1,000, when introduced into the blood stream, exercised a marked bacteriostatic effect on the invading organisms; if the resistance of

*Ann. Int. Med., Dec., 1932.

*A. J. Obst. & Gynecol., June, 1933.

the individual could be reinforced at the same time, our results would be most gratifying.

In our study, over a period of several years, many cases of various blood-stream infections have been studied and closely observed, Metaphen 1:1,000 having been used intravenously. Our results in the majority of cases have been remarkably gratifying, and in no cases have we found evidence of toxic effect or untoward reactions due to the treatment with this drug. On the basis of these observations, we have come to the conclusion that Metaphen, when introduced into the blood stream of individuals suffering from septicemia, acts as a bacteriostatic rather than a bactericidal substance. We believe that this property alone is responsible for the conspicuous absence of reactions; at the same time, the disease is treated along natural lines, since the individual's own resistance is permitted to play the prominent part which it should play in combating all infections.

J. B. BERNSTINE, M.D., F.A.C.S.

Philadelphia, Pa.

Ketogenic Diet in Urinary Infections of Children*

BY THE use of the ketogenic diet, the urine can usually be rendered bactericidal when its pH is below 5.6.

The bactericidal power apparently is not due to acidity alone nor to the presence of diacetic acid or sodium diacetone. Acidity, in synergy with substances not yet determined, probably accounts for the bactericidal action.

Ketonuria—the condition of the urine after the administration of a ketogenic diet—with a pH of 5.5, is an excellent antiseptic for clearing urinary infections, and ketonuria should prove useful in the preparation of patients for operation on the urinary tract.

Three patients with major urinary anomalies, at the Mayo Clinic, have been freed from infection by means of the ketogenic diet.

H. F. HELMHOLTZ, M.D.

Rochester, Minn.

Milk and Growth

THE suggestion by Dr. H. J. Achard, in your July issue, that fresh milk may contain an important growth hormone, which can cause increased stature in those who consume this important food, would seem to be confirmed by an experience reported by two British medical officers.

These physicians, Drs. J. B. Orr and J. L. Gilks, recently published the results of an in-

vestigation of the physique and health of two neighboring African tribes. Although from the same general stock and living in adjoining reservations, one of these tribes was vastly superior to the other in stature, strength and general health.

The superior tribe, the Masai, was found to subsist almost exclusively on milk and meat; while the inferior tribe, the Akikuyu, lives wholly on cereals and vegetables.

The result of this difference in diet is that the full-grown Masai man averages five inches taller and 23 pounds heavier than the Akikuyu. The milk-fed native also displays a muscular strength fully fifty percent in excess of that of his grain-fed neighbors. Similar superiority is shown among the female members of the Masai tribe.

From the standpoint of general health, the milk and meat diet seems likewise to offer distinct advantages, as defects of the bones and teeth, anemia, lung troubles and tropical ulcers are much more prevalent among the vegetarian Akikuyu than among the cattle-owning Masai.

This significant investigation has been reported in full in a pamphlet issued in 1931 by the Medical Research Council of Great Britain, and is also described in my recently published book, "Milk, the Indispensable Food" (Olsen, Milwaukee, 1933).

Milk is, of course, recognized as an excellent source of the growth-promoting vitamins A and G, and a good source of vitamin B, which is also conducive to growth. Whether the favorable effects of milk on human growth are due to these factors, or to others such as hormones, may be a question, but it is likewise a question whether the vitamins may not be in the nature of hormonal substances.

At any rate, milk is the best all-round food for inducing satisfactory growth, and the dietary maxim of a quart of milk a day in some form, for all growing children, has long been recognized as based on established scientific facts.

JAMES A. TOBEY, DR. P. H.

New York City.

Dr. Tobey seems to have overlooked Dr. Achard's point, that the milk of "fresh" cows may be richer in the growth hormones or vitamins than that of cows in the later stages of lactation; but his comments are so pertinent and well stated as to be worthy of publication.—Ed.

I enjoy CLINICAL MEDICINE AND SURGERY very much, so would hate to miss even one copy.—R. G. B., M.D., Iowa.

*J.A.M.A., Oct. 15, 1932.

General Uses of Digitalis*

IN RECENT years I have come to the belief that digitalis has a worthwhileness in treatment, entirely apart from its undoubted value in the control of cardiac decompensation.

I believe that cardiac enlargement is functionally harmful and that digitalis, in moderate doses will retard it and delay the appearance of symptoms and signs of cardiac insufficiency. Consequently, I advise patients in whom I find enlargement of the heart to decrease physical exertion and to take, continuously, from 0.1 to 0.15 Gm. of digitalis leaves twice daily, unless this amount causes toxic symptoms, in which case the dose should be lessened. Also, I have come to give digitalis in this way to patients in whom I can detect evidences of cardiac disease, particularly cardiac enlargement. It does seem as if cardiac enlargement is retarded.

Competent observers believe that, in elderly people, with no evidence of cardiac enlargement, but in whom circulatory efficiency is lessening, digitalis increases heart efficiency, and here digitalis possibly may be said to have a definitely "tonic" effect, presumably increasing the hydration of the heart muscle, which has decreased in the aging process.

Digitalis, for the conditions just discussed, is continued over very long periods of time. It is an ideal drug, pharmacologically, for long-continued administration.

H. A. CHRISTIAN, M.D.

Peter Bent Brigham Hospital, Boston.

The Aschheim-Zondek Test

THE Aschheim-Zondek test for pregnancy is the best means of determining early pregnancy. It is accurate in over 90 percent of all cases, giving positive reactions as early as twenty-one days after a fertile coitus and as early as ten days after a missed menstrual period due to pregnancy. The hormone called "prolan A," manufactured by the anterior lobe of the pituitary gland, is produced in large amounts in pregnancy and excreted in the urine. The urine is injected into immature female mice, where the hormone, if present, induces maturation of the ovarian follicles, with the production of hemorrhagic follicles and corpora lutea, in from fifty to one hundred hours.

The test returns to negative from eight to ten days after delivery, but is supposed to be positive as long as any living fetal tissue remains in the uterus. Aschheim has pointed out that a positive reaction to the test occurs as long as the fetus lives and the chorion is in living contact with the mother's circulation. Within a few days after the death of the

fetus, the test fails to produce a reaction. Cases in which the fetus is dead have been diagnosed by a negative reaction.

While the largest rôle of the test in the female, at present, lies in diagnosing early pregnancy, it is of even greater value (a) in differentiating between pregnancy and fibroids of the uterus; (b) in ruling out pregnancy in the irregular menstruations of the menopause; (c) in ectopic pregnancy; and (d) in pseudocyesis.

The Aschheim-Zondek test gives positive results in cases of hydatidiform mole and chorionepithelioma, even with the use of very dilute specimens of urine; a positive test followed by a negative, after removal of a hydatidiform mole, is a valuable indication that the mole has not become a chorionepithelioma.

Blood can be employed for the test as well as urine, and other animals, as rabbits or rats, can be substituted for mice. In fact, the most common modification employed at present is the use of immature rabbits. These are injected intravenously and the ovaries examined for ovulation and hemorrhagic follicles after twenty-four to forty-eight hours. The active principle can be concentrated from the urine by alcohol fractionation, but Zondek found that, in some instances, the absence of positive reaction after concentration does not exclude pregnancy.

Positive reactions have been found in cases of teratoma of the testis in the male; in fact, one investigator finds prolan A in all cases of sex gland tumors of the male and feels that he can determine the presence of such tumors, estimate the efficiency of the treatment and recognize recurrences before clinical symptoms are detected. Therefore it is well, from the experimental viewpoint, to perform the Aschheim-Zondek test on all cases of tumors of the testis.

JOSIAH J. MOORE, M.D., F.A.C.P.

Ravenswood Hospital,
Chicago, Ill.

Actions and Uses of Dinitrophenol*

DINITROPHENOL, a well known chemical, has been shown to possess the power of augmenting metabolism. Given orally, in doses of 3 to 5 mgm. per kilogram of body weight, the basal metabolic rate was increased from 20 to 30 percent in the first hour and maintained there for about 24 hours. It had returned to normal on the third day. In doses of over 10 mgm. per kilo gave increases of temperature of 3° F., and commensurate increases in pulse and respiration. These high doses are considered dangerous.

Daily oral doses of 3 to 5 mgm. per kilo were

*J.A.M.A., Mar. 18, 1933.

*Cutting, Mehrtens & Tainter: J.A.M.A., 101:193, July 15, 1933.

given to nine patients, for periods of from 1 to 10 weeks, resulting in a rate continuously 40 percent above normal. All those lost weight without resort to dietary restrictions, the maximum loss being 20 lbs.

A New Percussion Technic*

IN the ordinary (pleximeter) method of percussion, the joint of the "hammer finger" often becomes swollen and painful and the muscles sore, leading to inaccurate work.

The technic of a method which I have taught and practiced exclusively during the past thirteen years is as follows:

The pleximeter finger (or fingers) is placed upon the thorax or other surface to be percussed in the usual manner. The pleximeter finger (or fingers) is pressed firmly or lightly upon the body wall, according as superficial or deep percussion is desired. The striking "hammer" is arranged by crossing the flexor surface of that portion of the second finger beyond the last interphalangeal joint of the percussing hand over the extensor surface of the index finger of the same hand, so as to have it cover practically the whole nail surface and that part of the index finger distal to the last interphalangeal joint. Then, by a quick, snapping movement, the second finger is slid from the index finger, so as to strike forcibly the extensor surface of the "pleximeter" finger (or fingers) of the other hand. A little practice readily enables one to strike a considerable staccato and resounding note upon the pleximeter.

This method permits long-continued work, with avoidance of fingers made painful by trauma and cramp.

FRANK SMITHIES, M.D., F.A.C.P.
Chicago, Ill.

The Frequency and Causes of Premature Birth†

OF 2,876 consecutive labors in two teaching hospitals, 238, or more than 8 percent, were premature in onset, as measured by infant birth weight. Approximately 80 percent of the 238 premature births were spontaneous in onset, the remaining 20 percent being induced by either medical or surgical means.

Of all spontaneous premature labors, the cause of 58 percent could be determined. Disease or abnormality of the uterus, its contents or appendages was responsible for 73 percent of known causes.

*Ann. Intern. Med., Oct., 1932.

†Am. J. Obst. & Gynec.

No cause for prematurity could be found in approximately 42 percent of spontaneous births. Spontaneous premature births of unknown cause were equally frequent in colored and white women.

Women under nineteen years of age give birth more frequently to premature infants than do those in later years.

The incidence of premature births appears to be greater in women who have been previously delivered prematurely, than in the population at large.

DRS. D. P. MURPHY AND J. E. BOWMAN.
Philadelphia, Pa.

Therapeutics of the Intravenous Drip*

THE slow, continuous "intravenous drip" is the best way to administer fluids into the circulation. It avoids the untoward reactions ("speed shock") that result from rapid intravenous injection. We have studied the use of the drip therapeutically in 100 cases, including hemorrhage, shock and infection, as a prophylactic in surgery, in exophthalmic goiter, in the treatment of postoperative complications, in metabolic and toxic conditions, and in terminal, inoperable and undiagnosed surgical conditions. Our experience is limited to the use of physiologic sodium chloride solution, 5 or 10 percent dextrose in physiologic saline and blood. Irrespective of the temperature of the fluid or the vehicle employed, the velocity of injection should not exceed 2 or 3 cc. per minute. The amount administered has depended upon the case. In one case of duodenal ulcer, 5 percent dextrose in physiologic saline was injected continuously for 144 hours, administering 40,000 cc. of fluid.

In hemorrhage we have started the dextrose saline drip as soon as possible, have added 500 or 600 cc. of citrated blood as soon as it could be obtained, and have then reverted again to dextrose-saline for as long as necessary.

In infection the drip may be used either as a supportive measure or for the purpose of administering a specific. To a patient with erysipelas we administered 50 cc. of streptococcus antitoxin with the dextrose-saline. To one with active tetanus we administered 72,000 units of tetanus antitoxin in 4,000 cc. of 5 percent dextrose over a period of 60 hours. To one with type 1 pneumonia, we gave 50,000 units of Felton's serum in one day. All three cases recovered. There is no danger of anaphylactic shock when anti-serums are injected by the intravenous drip, owing to the slow, continuous administration.

*J.A.M.A., 100:305, February 4, 1933.

As a prophylactic in surgery, the drip will prevent or relieve many or all of the unpleasant sequelae which follow prolonged, extensive or shock-producing procedures. In terminal inoperable and undiagnosed surgical conditions it may tide a patient over an emergency or be a life-saving measure. It should be used routinely in the operative treatment of exophthalmic goiter to prevent the thyroid crisis.

In metabolic or toxic conditions with dehydration, in diabetic coma with vomiting, and in anuria from mercury poisoning, the drip is invaluable. In diabetic coma, insulin is added as indicated—usually one unit per gram of dextrose. In one case of mercury poisoning the drip was maintained for seven days and sodium thiosulphate was administered with the dextrose-saline.

Drugs may be administered through the drip as indicated: morphine, intravenous digitalis, paraldehyde, caffeine, etc. If the effect is desired at once, the drug may be injected directly into the rubber tubing near to the vein.

The drip is not a specific panacea, but when used judiciously, with meticulous attention to cleansing and sterilization of the apparatus, it has therapeutic value exceeded only by definitely specific measures.

DRS. H. T. HYMAN AND SAMUEL HIRSHFELD.
New York and Los Angeles.

Diet of Expectant Mother*

THERE is evidence of a close relationship between maternal diet and development of teeth and osseous structure in the offspring; therefore, the prospective mother should be fed on a diet rich in vitamins and mineral substances, which help, not only to preserve her own osseous structures, but also assist in building up the offspring.

If the average adult requires from 2,200 to 2,500 calories daily, and the hard manual laborer requires about 3,500 calories, the pregnant woman, weighing about 135 to 140 pounds, should require daily rations yielding about 2,500 calories. This type of patient needs about 350 Gm. of carbohydrate, 125 Gm. of protein and 60 to 75 Gm. of fat. The amount of these ingredients may be varied with the individual patient. In selecting the food, those containing inorganic salts, especially calcium and phosphorus, and the necessary vitamins should be included. As a general rule, acid-producing foods should be kept low.

M. O. MAGID, M.D.

New York City.

*M. J. & Rec., June 1, 1932.

Rapid Method of Making Gram Stain*

Solutions:

- 1.—Methyl violet, 1 percent.
- 2.—Gram's iodine solution: 2 Gm. iodine crystals; 10 cc. normal NaOH solution; 90 cc. water (distilled).
- 3.—Acetone.
- 4.—Basic fuchsin solution, 0.05 percent.

Method:

- 1.—Methyl violet for 10 seconds and pour off.
- 2.—Iodine; pour off and reapply for 10 seconds.
- 3.—Acetone until no more color comes away.
- 4.—Wash with distilled water.
- 5.—Basic fuchsin for 10 seconds.
- 6.—Wash with distilled water and dry in air or flame.

SCIENTIFIC EXHIBIT, A.M.A.

New Approach to the Therapy of Migraine†

ATTEMPTS have been made to control migraine upon the supposition that it was dependent upon a spastic contraction, with subsequent relaxation, of the cerebral arterioles. Thus migraine would be directly traceable to an irritation of the sympathetic innervation.

The condition of hypersympatheticotonia may be readily converted into a temporary state of hypervagotonia by the hypodermic administration of ergotamine tartrate (**Gynergen**) which inhibits the peripheral end fibers of the sympathetic nerves. Activation of the calcium metabolism of the body by means of the ingestion of irradiated ergosterol (viosterol 250-D), plus any form of assimilable calcium, increases the threshold of resistance to sympathetic irritability to such an extent as to render migraine more amenable to ergotamine tartrate therapy.

In 6 cases in which Gynergen therapy was used, all the patients showed a satisfactory response. When an attack was definitely established, 1 ampoule (0.5 mgm.) was administered intramuscularly. Within from 20 to 25 minutes the patient began to feel a hot flush coursing through the body, lasting for about 5 minutes. This was soon followed by an intense feeling of nausea and vomiting. Following the vomiting the migraine disappeared as if by magic. Such results were not sporadic, but were met with persistent regularity.

L. G. IGNEZI, M.D.

Pittsburgh, Pa.

*Presented at A. M. A. meeting in June, 1933.

†M. J. & Rec., May 4, 1932.

DIAGNOSTIC POINTERS

Hyperinsulinism

THE term hyperinsulinism is used to designate a condition presenting certain subjective and objective symptoms and a low endogenous blood sugar. The symptoms include the following: nervous irritability and anxiety, weakness and fatigability, hunger, tremor, muscular twitching, lack of clearness of vision, diplopia, unsteadiness of gait, syncope, excessive perspiration, loss of emotional control, convulsions and even coma. These symptoms are all comparable to those which follow excessive doses of insulin at different levels of the hypoglycemic reaction.—Dr. L. G. HEYN, of Cincinnati, in *J.A.M.A.*, Apr. 23, 1932.

Glucose and Hydration

THE fact that each molecule of glucose (dextrose) is metabolized completely, leaving six molecules of water within the tissue cells while furnishing food and energy to them, has not been sufficiently stressed by physiologists and has not been completely understood by many surgeons.—DRS. R. W. MCNEALY and J. D. WILLEMS, of Chicago, in *Illinois M. J.*, June, 1932.

The Blood-Cell Count in Arthritis

IN 250 patients showing chronic arthritis, there were only 3 cases with normal blood counts. Two hundred and twenty-six (226) exhibited a nuclear shift to the left, and of this number 61 showed no juvenile cells or myelocytes.—DR. E. R. EATON, of New York, in *J. Am. Inst. of Homeop.*, Feb., 1932.

Glaucoma

THERE are many conditions of marked importance which are easily seen and diagnosed by the general practitioner by the aid of the ophthalmoscope; the simple matter of an eye-ground examination will often serve to preserve life and vision.

The picture of a glaucomatous cup is as distinct as that of any particular flower that grows, and is far better diagnosed and with more certainty than many of the ordinary ailments to which human flesh is heir. The end results of this condition are more damag-

ing, more lasting and as persecuting as a host of our chronic ailments, and yet the condition daily goes unrecognized, at a time when even proper medication should prolong eyesight and relieve the intense suffering endured by these unfortunates.—DR. L. W. GORTON, of Shreveport, La., in *Tri-State M. J.*, Jan., 1932.

Leukocytosis and Leukopenia

THERE appear to be two leukocytic tides in the 24 hours; the peaks usually appear in the afternoon and after midnight. They are not affected by moderate exercise, eating nor menstruation.

Typhoid fever, the paratyphoids, influenza, German measles, a number of poisons, such as arsenic and benzol, all cause a leukopenia.—DR. C. W. MUCKLE, of Philadelphia, in *M. J. & Record*, Feb. 3, 1932.

Blood Counts

MEDICAL diagnosis is largely dependent, in obscure cases, upon proper blood pictures. Surgical diagnosis and the need of operative interference may often be determined by the hemogram. The total count is comparatively insignificant in importance, as compared to the differential picture. Gross mistakes have been made where the total count alone has been considered. The total count must be taken in conjunction with the differential count.—DR. R. B. H. GRADWOHL, of St. Louis, in *Southern M. & S.*, Feb., 1932.

Arteriosclerosis

NIGHTURNAL frequency of micturition is a very common symptom of generalized arteriosclerosis, particularly in women.—J. E. R. McDONAGH, in *Nature of Disease Journal*, Vol. 2, (1933), p. 51.

Insulin and Hunger

HUNGER is perhaps merely nature's way of making known that the blood-sugar is low and needs replenishing. Blood of low sugar content, under ordinary circumstances, may be able to start impulses down the vagus nerve that stimulate gastric secretion and motility; and it is the increased peristalsis

which in turn registers in consciousness the gnawing emptiness that demands food. The known effect of insulin in stimulating the appetite is probably due to its stimulating influence on the functional activity of the stomach.—*Editorial, in J.A.M.A., Nov. 12, 1932.*

Uterine Allergy

AS illustrated by some clinical cases reported, painful, irregular, scanty or profuse menstruation may be due to food allergy. Food allergens, after their entrance into the blood, should be able to produce edema of mucous membrane and smooth muscle spasm in the female genital tissues. Abnormal uterine bleeding and leukorrhea, edema of the tubes, vagina or labia, and chafing, may arise from sensitization.—Dr. A. H. ROWE, of Oakland, Cal., in *Am. J. Obst. & Gynec., Sept., 1932.*

Stomach Disturbances of Extra-Gastric Origin

DUE to the peculiar embryologic relation of the stomach with other viscera concerned with the digestive processes, the stomach is functionally affected when the ailment is really extra-gastric; hence stomach dysfunction most frequently follows disease of the duodenum, the biliary tract and liver, the pancreas, the small and even the large intestine. These "functional upsets" may interfere with normal secretion of gastric juice but, more commonly, gastric motility becomes disorganized, resulting in more or less painful gastric spasms, delay in the stomach's emptying or, in extreme instances, of fatigue-type dilatation of the stomach.—Dr. F. SMITHIES, in *Edgewater Hosp. Staff News (Chicago), July-Aug., 1932.*

Individual Blood Pressures

INDIVIDUAL blood pressures do not necessarily conform to the average normal values. This is not appreciated so thoroughly as it should be. It is only natural to expect that each person will have a characteristic blood pressure, just as he has a basal metabolism, blood count, posture, facial expression, etc., that is influenced by heredity, occupation, habits and many other factors.—Dr. HERMAN O. MOSENTHAL, in "Nelson's Loose-Leaf Living Medicine."

Kidney Infections of the Adolescent Female

THERE is marked alteration in the entire body biochemistry of the adolescent female,

especially in the blood and lymph balance. This marked change is mostly centered in the female pelvis at an important point of elimination by the kidney. Pyelitis, in early adolescence in females, is a definite clinical entity, very similar to pyelitis in pregnancy. This often occurs with no discoverable focus of infection and must be attributed to ascending infection.—Dr. R. L. COWEN, of Detroit, in *J. Michigan S.M.S., July, 1932.*

Paranasal Sinusitis

IT IS interesting to note that most hayfever patients ultimately develop chronic sinusitis. Massive hydration of the sinus mucosa accounts for the startling variations observed in allergic individuals.

Unless unanticipated methods be developed, the solution of the problem of sinus infection in systemic disease, in the final analysis, will come from a statistical treatment of large series of clinical experiments, the validity of which rests on rigorous diagnostic studies and a surgical technic which accomplishes an *en masse* excision of infected tissue, with minimum trauma and without postoperative hemorrhage.—Drs. A. D. DUNN and F. L. DUNN, of Omaha, in *Ann. Intern. Med., Aug., 1932.*

Fracture of the Patella

IN NO other type of fracture is union without malposition so often followed by impairment of function as in transverse fracture of the patella. The cause appears to be a rapid atrophy of the quadriceps extensor muscle, which seems to be due to a peculiar trophic disturbance. The final result depends more upon the proper restoration of the normal anatomy and mechanics of the knee than upon the method of treatment used. A thorough knowledge of the anatomy and mechanics of the knee joint is demanded.—Dr. H. D. SONNENSCHN, of New York, in *M. J. & Record, July 6, 1932.*

Asthenopia

ASTHENOPIA is a syndrome in which the visual discomforts that attend prolonged close work are accompanied by feelings of fatigue and reflex manifestations remote from the eye. It differs from eye-strain, in that it does not promptly disappear when close work is discontinued. Asthenopia is a psychoneurosis.

No asthenopic patient should be told, "There is nothing the matter with you; forget it!" There is something the matter with him; he cannot forget it; and he *will not* for-

get who told him! Thorough questioning will reveal the direct and contributing causes of symptoms. A carefully planned and executed examination will disclose the nature and extent of ocular and visual defects; it will likewise impress the patient that he is being taken seriously and that his case will be understood. Dr. C. W. RUTHERFORD, of Iowa City, in *J.A.M.A.*, July 23, 1932.

Pancreatic Disease

IN ACUTE pancreatic disease, the skin may partake of the livid or slate-colored hue so commonly seen in the face and lips. When present, this change of color is characteristic and is not found in any other acute abdominal condition.—Dr. R. D. FORBES, of Seattle, in *Western J. Surg. Obst. & Gynec.*, Aug., 1932.

Enuresis

DAY or night bed wetting is the usual criterion for the diagnosis of enuresis. When these symptoms persist longer than two to three months despite medical, physical or psychotherapy, a urologic examination is indicated.

In a series of 249 cases, investigated upon this indication, organic disease was disclosed in more than a half. The enuresis was found symptomatically associated with nearly every known type of uropathy. When there is no demonstrable uropathy, one may rest assured that normal vesical control will be established ultimately.—Dr. M. F. CAMPBELL, of New York, in *J. Urol.*, Sept., 1932.

Abscess of the Breast

THE study of forty-three cases of abscess of the breast, seen in private practice during five years, has shown that it is a condition fairly common in an individual obstetric practice. It is a disease of the primipara and of the blonde. It is two and one-half times as common in the autumn and winter as in spring and summer. The average abscess occurs during the baby's sixth week and the baby is overweight. It is more common among the well-to-do and it does not depend on deformities of the nipple. Foci of infection and trauma seem to play a part in it. There is some evidence that the infection is carried to the breast by the blood stream.—Dr. F. B. SMITH, of Houston, Texas, in *Am. J. Obst. & Gynec.*, July, 1932.

Detection of Albumin in Cloudy Urine

THE following modified Heller nitric acid contact test is used at the Chicago Free Dispensary to test cloudy urine for the presence of albumin:

1.—About 1 cc. of nitric acid is overlaid with an equal quantity of urine—the regular Heller test.

2.—In the event that cloudiness interferes with the reading of the test, the urine and nitric acid are mixed by agitation, urates and bacteria are both digested and the contents of the tube becomes clear.

3.—The mixture is overlaid with about 1 cc. of 20 percent sodium hydroxide solution and allowed to stand.

If albumin is present, a precipitate of syntonin (acid albuminate) will appear at the point of contact and spread through the alkali layer. Uric acid and bacteria residues give no ring.—HELEN E. WOOLEY, R. D. BARNARD AND G. H. GOWEN, M.D., in *Illinois M. J.*, July, 1932.

Importance of Clinical Diagnosis in Surgical Conditions of Abdomen

AN EDITORIAL by Dr. W. J. Mayo, of the Mayo Clinic, in *Surg. Gynec. & Obstet.*, Sept. 1932, calls attention to the fact that, before the x-rays played so great a part in the diagnosis of disease of the gall-bladder as they do today, the clinical diagnosis was 90 percent correct. Since the x-rays have been used to make the diagnosis rather than to confirm it, diagnoses of gall-bladder trouble are only 70 percent correct. This loss in accuracy applies also to diagnosis of ulcer of the posterior wall of the duodenum and of the stomach. The x-rays will be correct in about 95 percent of the cases of ulcer, but in at least 5 percent they may be misleading.

The laboratories should be used for the purpose of aiding the clinical diagnosis, but should not supersede it.

Imagination and Disease

IMAGINARY diseases are not imagined diseases.

The man, or woman, who thinks that he, or she, is sick—is sick.

Worry is caused by badly-controlled imagination.

"Neurasthenics" have the most vividly riotous and ill-controlled imaginations.—H. J. ACHARD, M.D.

NEW BOOKS

Any book reviewed in these columns will be procured for our readers if the order, addressed to CLINICAL MEDICINE AND SURGERY, North Chicago, Ill., is accompanied by a check for the published price of the book.

*O books, ye monuments of mind; concrete wisdom of the wisest;
sweet solaces of daily life; proofs and results of
immortality!*—MARTIN FARQUHAR TUPPER.

McDonagh: Nature of Disease

THE NATURE OF DISEASE JOURNAL.
By J. E. R. McDonagh, F.R.C.S., Volume
2. 1933. London: William Heinemann, Ltd.
(Through Chicago Medical Book Company,
Congress and Honore Streets, Chicago.) Price:
\$3.00.

The *Nature of Disease Journal* is a serial supplement to McDonagh's three-volume work, "The Nature of Disease," recording the progress made in his studies, which can be bound as the issues accumulate and added to the set.

These supplements are more clearly written and understandable than the original volumes, but still seem a bit subliminal and assume a number of things which most readers would like to see more clearly proved. Nevertheless, they are indispensable to those who are following the work of this bold and revolutionary researcher.

The basis of McDonagh's philosophy is expressed in his editorial introduction. "Medicine should always have remained a unit, with an eye directed toward every aspect of human affairs, since its province is to prevent and correct every abnormal activity of the human organism." A few more brief quotations will round out this picture: "Disease is just as much a mental as a physical defect." "The physician should know what health is before he begins to study disease." "(Many doctors are) cast out to the unsuspecting public without an idea what to do for the common cold, the common chilblain, the peevish child and the hypochondriacal old maid, and these will most certainly form the bulk of their practice."

The three problems approached in this volume are all pertinent and immediately practical: *Arterial Degeneration; Shock; and Infections from Within.*

Several of the matters elaborated in the first section were touched upon in the review of the first volume of this publication, which appeared in the November, 1932, issue of this journal, on page 828. This should be referred to. More case histories are added.

The section on shock is based upon the thesis: "'Shock' is a term which can be applied to the clinical signs and symptoms produced by the sudden arrest of hydrated protein particles in the circulation. The adjective, 'sudden,' is added to mark an arbitrary line of demarcation between shock and most of the chronic manifestations of disease, which are the result of the activity of hydrated protein

particles precipitated somewhere in the circulation."

Here, again, we find startling ideas, backed up by case reports and protocols of experiments upon animals. It behooves progressive physicians to familiarize themselves with these ideas, whether they accept them or not.

The third section is an elaboration of his articles which appeared in this journal in the September, 1932 (page 641), and March, 1933 (page 139), issues, with a revised diagram, combining those accompanying these articles, and a number of case reports.

A good deal of study is needed by the average physician, in order to familiarize himself with McDonagh's terminology and the normal basis of comparison with his reports of the results of his special blood studies, but the experience of those who are using his methods seems to indicate that such study will prove highly profitable, both professionally and financially, to those who will use these ideas in their daily work.

Groves: Surgery

A SYNOPSIS OF SURGERY. By Ernest W. Hey Groves, M.S., M.D., B.Sc. (Lond.), F.R.C.S. (Eng.) Consulting Surgeon to the Bristol General Hospital; Emeritus Professor of Surgery, Bristol University; Member of the Court of Examiners, Royal College of Surgeons, England; Late Examiner in Surgery, Universities of London, Liverpool, Leeds, Manchester, and Sheffield. Illustrated. New York: William Wood and Company. 1933. Price: \$5.00.

The literature of surgery has grown until a complete system of this specialty requires several volumes. Such a work or works are necessary for those who do much operating, but are of little immediate value to busy practitioners.

This volume is an attempt to present the salient facts of surgical practice in such a way that they can be easily and rapidly referred to. The arrangement, headings, type and indented margins add to this facility of use. Only the main points of operations are considered. This tenth revision brings the subject matter up to date.

This is rather more than a compend and considerably less than a textbook, and will be of great value to active general clinicians, for quick reference and suggestions, and to students and others who are preparing themselves for examinations.

Balyeat: Migraine

MIGRAINE. Diagnosis and Treatment. By Ray M. Balyeat, M.A., M.D., F.A.C.P., Associate Professor of Medicine and Lecturer on Diseases Due to Allergy, University of Oklahoma Medical School; Chief of the Allergy Clinic, University Hospital; Director, Balyeat Hay Fever and Asthma Clinic, Oklahoma City, Okla., etc. Illustrated. Philadelphia, Montreal and London, J. B. Lippincott Company. 1933. Price: \$3.00.

The migraine problem is by no means yet solved, but the treatment by dietary manipulation, based on specific sensitization, is probably as satisfactory, or more so, than the treatment of practically any other chronic disease. The material here presented takes up most of the problems encountered in the diagnosis and treatment of the migraine syndrome, which affects about 7 percent of the people in the United States.

This book covers the definition of migraine and historic consideration; the hereditary factor in migraine; incidence of migraine; etiology; symptomatology; pathology; laboratory data and prognosis; treatment of non-allergic and allergic migraine; the localization and specificity of cellular sensitization; clinical records in proven cases of allergic headache, illustrating methods of diagnosis of migraine from other allergic headache, and treatment.

All internists and general clinicians will find material in this volume which will be interesting and of practical value.

Pusey: Syphilis

THE HISTORY AND EPIDEMIOLOGY OF SYPHILIS. The Gehrman Lectures, University of Illinois, 1933. By Wm. Allen Pusey, A.M., M.D., LL.D., Professor of Dermatology Emeritus, University of Illinois, Sometime President of the American Dermatological Association and of the American Medical Association. Springfield, Illinois and Baltimore, Maryland: Charles C. Thomas. 1933. Price: \$2.00.

This is an interesting volume for the bibliophile and student of medical history—a beautiful and unusual piece of bookwork to add to one's collection. The section on epidemiology is, perhaps, unique. Its practical value to the active and absorbed clinician is negligible; but cultural values deserve and need more attention.

His: A German Doctor at the Front

A GERMAN DOCTOR AT THE FRONT (DIE FRONT DER ARZTE). By Professor Dr. Wilhelm His. Translated from the original German by Colonel Gustavus M. Belch and General Jefferson R. Kean. Washington, D. C.: Association of Military Surgeons, Army Medical Museum, 1933. Price: \$2.50.

This is an unusually interesting and instructive narrative of Professor His' observations of the medical activities of the German armies and of his personal experiences and studies in many countries, as a consulting internist.

Professor His, known throughout the medical world as the discoverer of the His bundle of the heart and regarded as one of the greatest clinicians of the world, in this book shows

himself, not only as a medical scientist, but also as a charming writer.

Having been ordered to all fronts—to Poland, Galicia, Russia, Turkey, Palestine, Syria and the Ukraine—in his professional capacity, he not only narrates the work done to suppress several epidemics, but describes the peoples and their countries, with their flora and fauna.

The work, though describing the nature of the less known epidemics in popular language, is not, strictly speaking, a medical book (although, of course, the medical *motif* predominates), but rather a review of the German side of the War and that of Germany's allies, combined with their social, political, ethnic and cultural characteristics.

The translation is well done, so that the shadings of the original idiom are preserved. This book will not only add to the physician's cultural background, but can be placed in the hands of intelligent laymen, because it shows the true value of scientific medicine, as compared with the pretensions of cultists and faddists.

Transactions of the College of Physicians of Philadelphia

TRANSACTIONS OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA. Third Series. Volume The Fifty-Fourth. Philadelphia: Printed for the College. 1932.

The fifty-fourth volume of the third series of the Transactions of the College of Physicians of Philadelphia contains all the papers read before the college from Jan., 1932, to Dec., 1932, inclusive. The first part is devoted to contributions on general medicine and is followed by the proceedings of the sections on ophthalmology and otology and laryngology.

Cowdry: Arteriosclerosis

ARTERIOSCLEROSIS. A Survey of the Problem. A Publication of The Josiah Macy, Jr. Foundation. Edited by Edmund V. Cowdry. Washington University, St. Louis. New York: The Macmillan Company. 1933. Price: \$5.00.

Arteriosclerotic changes have generally been accepted by clinicians as a manifestation of the process of ageing and, hence, unavoidable and beyond human control. This hopeless therapeutic attitude has been altered by experimental approaches to the study of the vascular changes and by recent advances in biochemistry. The concept of the blood circulation itself has received a wider meaning by a better knowledge and appreciation of the metabolic exchanges of body fluids in tissues and between tissue cells. It is quite possible that arteriosclerosis may be as much a result of disordered metabolic and other functional processes as of the presumed degenerative effect of biologic age.

Researches on arteriosclerosis have been scattered and not correlated. This volume presents a survey of the whole problem, in twenty-three contributions by leading American and European investigators who are acknowledged as leaders in their special fields. The object is, not to formulate a textbook, but to bring to light all the known facts and, by viewing the subject from many angles, to reveal the most promising lines for further research. It is a comprehensive synopsis of all

scientific data concerning arteriosclerosis and associated conditions—experimental, biologic, etiologic, pathogenic, factorial and theoretic—and must be regarded as an authoritative presentation of the known facts which tend to show that arteriosclerosis has ceased to be an isolated problem of the vascular system.

The introduction is written by Professor Ludwig A. Schott, of the University of Freiburg, Germany.

Although, as a contribution to medical literature, the volume furnishes fascinating and valuable reading, there is but little in it that can be applied clinically or therapeutically.

Cockayne: Skin Abnormalities

INHERITED ABNORMALITIES OF THE SKIN AND ITS APPENDAGES. By E. A. Cockayne, D.M., F.R.C.P., Physician to the Middlesex Hospital, Physician to Out-Patients, Hospital for Sick Children, Great Ormond Street, New York and London: Humphrey Milford, Oxford University Press. 1933. Price, \$8.00.

For the first attempt of its kind, the author has chosen those abnormalities which cause some change in the skin, teeth, hair or nails. These have been chosen because they readily attract attention, because it is easy to get family histories, and because they are of distinct interest to everyone.

The book has two objects: a reference work for dermatologists; and to enable geneticists to see by the data given what defects are suitable for further study. Two illustrations are of unusual interest; the one, on page 183, of John Lambert, showing his bark-like, bristly skin, will surely make Mr. Ripley grieve over not having such a specimen for his Odditorium at the Century of Progress Exposition. Anyone interested in human abnormalities should not fail to give this book a thorough reading.

Magnuson: Fractures

FRACTURES. By Paul B. Magnuson, M.D., Associate Professor of Surgery, Northwestern University Medical School, Chicago. Illustrated. Philadelphia, Montreal and London: J. B. Lippincott Company. 1933. Price: \$5.00.

One good reason for writing a book is that the author passes on to others facts which his own observation, study and practice have developed as original or as improvements on existing methods of dealing with any given condition. Dr. Magnuson's book on fractures is of this type; it is to a great extent a personal book, written from his own experience or from the results of suggestions offered by fellow practitioners. The main object is to meet the needs of the doctor who first sees and treats a fracture; to furnish information which will make this treatment simpler and easier and improve the end result.

The manipulative method of dealing with fractures is the principal thesis. The author considers that the surgeon who first deals with a fracture case should have knowledge of the special operations which can be performed to improve the end result, and thus enable him to judge whether a given operation is applicable to the case. The principal operative procedures are, therefore, indicated for those who are skilled sufficiently to use them.

All the methods described here have been thoroughly tried in daily practice. The author does not deny that other methods may be as good or even better; but the procedures recommended have worked in practice and given good end results. "With thought and attention to detail, they will work in the hands of any man, because they all take into consideration the anatomy and physiology of the parts under treatment, with the mechanical features simplified so that they may be applied without any great amount of special equipment."

From what has been said it should appear evident that the volume is particularly suitable for the general practitioner and surgeon. Practical experience, with judgment of the worth of what is new in this special field, as boiled down here in less than five hundred pages, should be invaluable to the younger medical men.

Fractures of all the important bones of the body are included, except fractures of the jaw, which the author considers call for special knowledge and equipment.

Surgical Pathology

SURGICAL PATHOLOGY. By William Boyd, M.D., M.R.C.P. (Ed.), F.R.C.P. (London), Dipl. Psych. F.R.C.S., Professor of Pathology, University of Manitoba; Pathologist to the Winnipeg General Hospital, Winnipeg, Canada. Third Edition, Thoroughly Revised. With 477 Illustrations and 13 Colored Plates. Philadelphia and London: W. B. Saunders Company. 1933. Price: \$10.00.

In the foreword, Dr. William J. Mayo states: "What is needed today in the literature of surgical pathology is a work that will serve as a handbook to the surgeon, and the internist, and a guide to the beginner in the field of medicine. Doctor Boyd has made an earnest effort to fill this need." The clinical features of most of the conditions have been summarized in order to demonstrate the relationship between pathology and symptomatology. Pathology from the practical standpoint has been kept in mind throughout. Revisions over the two previous editions have increased the scope of the text and brought it strictly down to date. The book is didactic in tone, is well illustrated and has been written both for the student and the practitioner.

Vischer: Pulmonary Tuberculosis

A HANDBOOK OF PULMONARY TUBERCULOSIS. By Carl V. Vischer, M.D., F.A.C.P., Associate Professor of Medicine, Hahneman Medical College, Phila.; Chief, Medical Out-patient Department, Hahneman Hospital, Phila.; Associate, Devitt's Camp for Tuberculosis, Allentown, Penna. With a Chapter on "Pulmonary Tuberculosis and the Cardiovascular System," by Lovell L. Lane, A.B., M.D., Instructor in Medicine, Hahneman Medical College, Phila.; Associate Electrocardiographer, Hahneman Hospital, Phila. Illustrated. Collingswood, New Jersey: Robert F. Rapp. 1932. Price: \$3.00.

This is a pocket-size text on pulmonary tuberculosis which, though necessarily brief, is a fairly complete survey of the field. It makes no claim for originality, but, due to the logical arrangement of the material and the

pertinent observations of the author, it forms a valuable addition to the literature on the subject.

The chapter on the relation of pulmonary tuberculosis to the cardiovascular system is particularly apt and well done.

The book should be very useful to students for review and to busy practitioners for quick reference in their daily practice. A. S. P.

Classification of Diseases

CLASSIFICATION OF DISEASES. *As Adopted by the Massachusetts General Hospital, Boston City Hospital, Carney Hospital, Peter Bent Brigham Hospital, Massachusetts Memorial Hospitals, Beth Israel Hospital and Others. Eighth Edition, revised. Boston: T. O. Metcalf Co. 1931.*

This Classification is arranged in as simple a form as possible and contains a full general index, so that any disease may be readily located under its proper section. The arrangement of diseases is strictly alphabetic. The Foreword contains directions for using the classification. A number of revisions have been made over the Seventh Edition, making it fully accurate as to terminology. Unfortunately, it contains errors in some of the International numbers affixed to terms. To correct them, a list of "errata" is attached for insertion by the purchaser. Considerable space is available for making notes, enabling the user to make of it a handbook both for immediate and future reference. Such use would add much to the accuracy of case reports and official documents.

Pullman: Foot Hygiene

FOOT HYGIENE AND POSTURE. *For Adults and Children. By M. J. Pullman, D.S.C., F.S.A.C., Fellow Scientific Association of Chiropractors International. Illustrated. Published by the Author, 411 West Seventh Street, Los Angeles, California. 1933. Price: \$3.00.*

This paper-bound brochure of 200 pages (15 of which are devoted to testimonials for the book and its author) is a highly colloquial discussion of the proper care of the feet and the treatment of their abnormalities, interspersed with more or less pertinent verses and odds and ends of more or less accurate general information. It might be of value in educating laymen as to the care of their feet, but its chief purpose seems to be to promote the sale of the author's apparatus for foot exercise.

Cameron & Gilmour: Biochemistry

THE BIOCHEMISTRY OF MEDICINE. *By A. T. Cameron, M.A., D.Sc., F.I.C., F.R.S.C., Professor of Biochemistry, Faculty of Medicine, University of Manitoba; Biochemist, Winnipeg General Hospital; and C. R. Gilmour, M.D., C.M., F.R.C.P. (C), Professor of Medicine and Clinical Medicine, University of Manitoba; Physician, Winnipeg General Hospital. 31 Illustrations. Baltimore: William Wood & Co. 1933. Price, \$7.25.*

This book is designed both for the student of medicine, receiving clinical instruction in the later years of his course, and for the phy-

sician who received no special instruction in the medical applications of biochemistry. To make it more useful to physicians who have had little or no biochemical training, the necessary amount of the biochemistry of normal man has been introduced to make the treatment of pathologic states intelligible. Some of the subjects considered are the normal and abnormal metabolism of fat, carbohydrate and protein; albuminuria; diabetes mellitus; the endocrine secretions; the vitamins and vitamin deficiency diseases; and liver functions and tests. Naming these few subjects merely hints at its contents. The book is a storehouse of facts for daily reference and use by physicians in general practice and the specialties.

Practical Medicine Year Books

NO physician, today, has time to read the entire periodical literature of his profession, nor, if he is at all busy, even of one specialty; and yet he must keep abreast of what is going on, if he aspires to achieve success.

This series of Year Books offers a time-saving method for keeping up-to-date. Careful and competent editors continually peruse the literature of their specialties, selecting for abstracting such articles as seem to possess general and permanent practical interest and value. To these they add pertinent comments, based upon their own wide experience, thus producing a group of books which, individually or as a set, will be very helpful to any general clinician or specialist, in keeping himself posted on the newer developments.

The following volumes of the 1932 series are now available from The Year Book Publishers, Inc., Chicago:

GENERAL SURGERY (about 800 pages; price, \$3.00), edited by *Evarts A. Graham, M.D., Professor of Surgery, Washington University School of Medicine, St. Louis.*

EYE, EAR, NOSE AND THROAT (about 625 pages; price, \$2.50); *"The Eye,"* edited by *E. V. L. Brown, M.D., Professor of Ophthalmology, University of Chicago, and Louis Bothman, M.D., Associate Professor;* *"The Ear, Nose and Throat,"* edited by *George E. Shambaugh, M.D., Clinical Professor of Otolaryngology, Rhinology and Laryngology, Rush Medical College.*

OBSTETRICS AND GYNECOLOGY (about 650 pages; price \$2.50); *"Obstetrics,"* edited by *Joseph B. DeLee, M.D., Professor of Obstetrics, University of Chicago;* *"Gynecology,"* edited by *J. P. Greenhill, M.D., Attending Gynecologist, Cook County Hospital.*

UROLOGY (about 450 pages; price, \$2.25), edited by *John H. Cunningham, M.D., Associate in Genito-Urinary Surgery, Harvard University Post-Graduate School of Medicine.*

DERMATOLOGY AND SYPHILOLOGY (about 450 pages; price, \$2.25), edited by *Fred Wise, M.D., Professor of Dermatology and Syphilology, New York Post-Graduate Medical School and Hospital of Columbia University, and Marion B. Sulzberger, M.D., Associate in Dermatology and Syphilology.*

NEUROLOGY AND PSYCHIATRY (about 450 pages; price, \$2.25); *"Neurology,"* edited by *Peter Basso, M.D., Clinical Professor of Nervous and Mental Diseases, Rush Medical College of the University of Chicago;* *"Psychiatry,"* edited by *Franklin G. Ebaugh, M.D., Professor of Psychiatry, University of Colorado.*

Dorrance: Cleft Palate

THE OPERATIVE STORY OF CLEFT PALATE. By George Morris Dorrance, M.D., F.A.C.S., Professor of Maxillo-Facial Surgery, The Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania; etc. Assisted by Enayat Shiraazy, D.D.S. Illustrated. Philadelphia and London: W. B. Saunders Co. 1933. Price: \$6.50.

The book is exactly what the title indicates: Tracing as it does this operative procedure from its first appearance in medical literature to the present. Extensive literary research was necessary for the author to so meticulously give credit to the many individuals who have written on the subject.

The operative procedure is discussed according to method and chronological appearance in the literature, thereby occasioning repetition.

Liberal illustration with generous legend of either the originator of the method portrayed, or by the author as he understands the description, helps much in the understanding of the text.

Each chapter prepares for the understanding of the following: All phases (history, embryology, etc.) of this deformity, to conclusions where the best treatment is decided, are considered.

The chapter on applied anatomy and pathology gives information not obtainable in the textbooks on either subject.

A complete bibliography at the end of the text simplifies one's own reference reading. It is a book which the surgeon interested in the correction of the cleft palate can with great advantage add to his library.

F. J. N., Jr.

Medical Clinics

MEDICAL CLINICS OF NORTH AMERICA. New York Number. Volume 17, No. 1, July, 1933. Philadelphia and London: W. B. Saunders Company. Issued serially, one number every other month. Per clinic year, July, 1933, to May, 1934. Price: Paper, \$12; cloth, \$16.

The July, 1933, number contains 21 contributions from New York City clinics.

There is an excellent critical paper on epidemic cerebrospinal meningitis in children, based on 44 cases, by Dr. A. G. DeSanctis. Skin tumors, especially precancerous dermatoses, are well discussed by Dr. Walter J. Highman. Dr. J. Epstein reports that he found gold tribromide to be an effective remedy in a large number of cases of pertussis. The drug is soluble in water and is given by mouth. The following three papers are good practical contributions to commonly observed conditions: "Intensive Ambulatory Treatment of Patients Suffering from Advanced Cardiac Insufficiency," by Dr. Meyer Friedenson; "Hypertension: Three Problems in Diagnosis," by Drs. Arthur Weiss, Alex. Grossman and M. A. Feinstein; and "Diagnostic Importance of Blood Volume and Cardiac Output Studies in a Borderline Case of Thyrotoxicosis," by Dr. A. A. Goldbloom.

The other contributions deal mostly with conditions not frequently seen by general practitioners.

Surgical Clinics

SURGICAL CLINICS OF NORTH AMERICA. Lahey Clinic Number, Boston, Mass. Volume 13, Number 3, June, 1933. Philadelphia and London: W. B. Saunders Company. Issued serially, one number every month. Per clinic year, June, 1933, to April, 1934. Prices: Paper, \$12; cloth, \$16 net.

The June, 1933, number of the Surgical Clinics of North America contains 28 contributions from associates of the Lahey Clinic, Boston. Dr. F. H. Lahey opens with a description of three types of pulsing esophageal diverticula and their management, based on 42 cases surgically treated. This author also writes upon the selection of the operative procedure for various gastric and duodenal lesions and contributes an excellent clinical paper on "The Decision for Surgery and the Management of the Patient with Hyperthyroidism." A short but good paper, on "Diagnosis of Carcinoma of the Colon," is contributed by Dr. Sara M. Jordan. Dr. Richard B. Cattell has found that between 55 and 60 percent of cases of malignant disease of the large bowel are operable. Four operations for cancer of the rectosigmoid and rectum are utilized and described. Dr. Gilbert Horrax furnishes an excellent technical contribution on the "Treatment of Pituitary Adenomata," and Dr. Walter B. Hoover another on "The Laryngeal Examination: Its Role in the Diagnosis and the Treatment of Thyroid Disease," which should be found valuable by practitioners. Dr. G. E. Haggart writes on the value of multiple-chip bone grafts in old ununited fractures. Two other papers by Dr. Richard B. Cattell, one describing a new technic for circular amputation of the cervix and the other on the management of extruded cervical fibroid, will be found interesting and suggestive.

There are a number of other short but valuable papers, among which we would specially mention one on the selection of anesthetics for abdominal operations by Dr. L. F. Sise and one by Dr. F. N. Allan on "Surgery and Diabetes," in which he shows that the risk of operation on diabetetic patients need not be feared, if careful attention is paid before and after operation.

Lichtwitz, Liesegang and Spiro:
Colloids in Medicine

MEDIZINISCHE KOLLOIDLEHRE. Lieferung 2, Seite 81-152; Lieferung 3, Seite 153-232; Lieferung 4, Seite 233-304; Lieferung 5, Seite 305-384. Herausgegeben von Prof. Dr. L. Lichtwitz, Direktor der I. Inn. Abt. des Rudolf-Virchow-Krankenhaus Berlin; Dr. Dr. Raph. Ed. Liesegang, Frankfurt a.M.; and Prof. Dr. Karl Spiro, Direktor des Physiologisch-Chemischen Instituts der Universität Basel. Mit Vielen Abbildungen. Dresden und Leipzig: Verlag Von Theodor Steinkopff. 1932. Price: geh RM 5.—each.

These are Parts II, III, IV and V of the work on colloids in medicine, Part I of which was reviewed on page 130 of the Feb., 1933, issue of CLIN. MED. & SURG.

MEDICAL NEWS



(c) Keystone-Underwood

Speech Without a Larynx

HERE is another apparatus for giving a voice to the surgically voiceless, invented by D. McKnight, who is shown using the newest model of his device and holding an old and clumsy model under his left arm. Squeezing the bellows produces the voice (adjustable to male or female tones), which is formed into words by the mouth and tongue.

Passing of Dr. Dodson

DR. JOHN M. DODSON, noted medical educator and editor of *Hygieia*, passed to his rest August 16, 1933, at the age of 74 years.

He was born in Berlin, Wis., and was graduated in medicine from Rush Medical College, Chicago, and Jefferson Medical College, Philadelphia. He joined the faculty of Rush in 1889, and will be remembered by hundreds of physicians as Dean of Students in that institution from 1901 to 1924.

An Undiagnosed Fever

SCIENCE NEWS LETTER is authority for the statement that a strange, protracted fever, for which no cause has yet been found, has been studied in 100 cases at the Mayo Clinic. All patients were over 15 years old and had had the fever for a month or more (average, a year and a half; longest time, 11 years); 72 percent were women; only 6 appeared to be definitely ill, though all had to stay in bed; most of them were emaciated, nervous, tired and weak.

The fever comes on, without a preceding chill, in the afternoon and reaches 99° to 100° F. Slightly more than half of the patients recovered spontaneously after a period averaging 28 months.

Physicians are urged to watch for and report cases of this fever, which may be due to infection, some nervous condition or faulty diet.

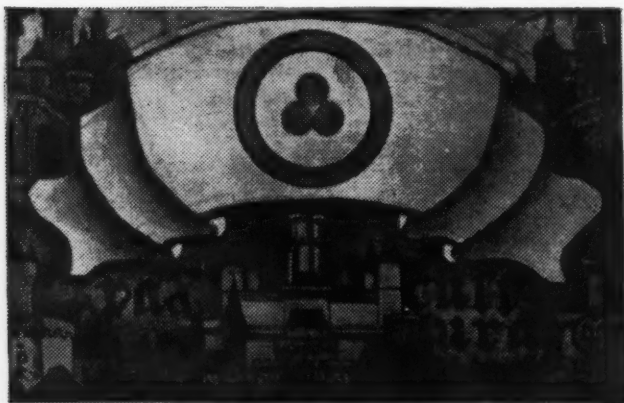
Sexus

THE first issue of a new international magazine, *Sexus*, has recently been published as the official organ of the World League for Sexual Reform. It is described as an "international quarterly review, covering the whole territory of sexual science and reform."

Dr. Magnus Hirschfeld, of Berlin, one of the foremost students of sex in the world, the editor-in-chief of *Sexus*, contributes the leading article for the first number, in which he outlines the aims of the new journal. While Hirschfeld's article is written in German, other contributions are in English and French.

Most interesting to Americans is the article on "Prostitution in New York, Past and Present," by Dr. Harry Benjamin of New York. It is the first installment of a somewhat novel discussion of the "oldest profession." Although Benjamin's article describes in a purely objective manner the changes that have occurred in the past thirty years in the legal aspect and handling of the prostitution problem in New York, the author advanced some rather startling ideas, which way well cause the authorities to sit up and take notice.

Dr. Norman Halre, of London, contributes a "Report on the Laws Governing Abortion," urging their modification.



Painting of Roerich's Banner of Peace

Peace Banner Convention

IN OUR issue for August, 1930 (page 630), we published an article by Professor Nicholas Roerich, of New York, setting forth his project for the adoption of a "Flag of Civilization," for the international protection of museums, libraries, cathedrals and other cultural monuments of the past in time of war, as the Red Cross flag now protects hospitals and similar institutions.

This proposal has been heartily indorsed by the International Museums' Committee of the League of Nations and by various governmental and cultural bodies, as well as by many notable personages throughout the world.

A Peace Banner Convention will be held in Washington, D. C., November 17 and 18, 1933, at which the speakers will be leaders in all fields of cultural endeavor from many nations. All societies and individuals interested in this worthy and much needed movement are invited to attend and participate in this convention.

Full particulars may be obtained by addressing The Roerich Museum, 310 Riverside Drive, New York City.



Professor Nicholas Roerich

Warning!

IN NOVEMBER and December, 1932, and January, 1933, David Nichols & Co., advertised in these pages to furnish professional stationery to physicians.

We have just discovered that this concern is unreliable, and therefore warn our readers not to send them any money.

SEND FOR THIS LITERATURE

TO ASSIST doctors in obtaining current literature published by manufacturers of equipment, pharmaceuticals, physicians' supplies, foods, etc., CLINICAL MEDICINE AND SURGERY, North Chicago, Ill., will gladly forward requests for such catalogs, booklets, reprints, etc., as are listed from month to month in this department. Some of the material now available in printed form is shown below, each piece being given a key number. For convenience in ordering, our readers may use these numbers and simply send requests to this magazine. Our aim is to recommend only current literature which meets the standards of this journal as to reliability and adaptability for physician's use.

Both the literature listed below and the service are free. In addition to this, we will gladly furnish such other information as you may desire regarding additional equipment, or medicinal supplies. *Make use of this department.*

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